Serfojee Rajah 1817

A

TREATISE

ON THE

ORIGIN, PROGRESS, PREVENTION, AND TREATMENT,

OF

CONSUMPTION.

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THE SECOND EDITION.

London:

PRINTED FOR RICHARD PHILLIPS, 6, BRIDGE-STREET;

By R. Taylor and Co. 38, Shoe-lane.

1807.

TO

MAXWELL GARTHSHORE,

M.D. F.R.S. &c. &c.

Dear Sir,

IN the privilege you have allowed me of dedicating this small Volume to you,—the first I have ventured to send into the world,—I feel a high degree both of pride and pleasure, on account of that eminent rank you have so long held in the medical profession, and of that friendly and generous zeal for my interest and welfare which you have so repeatedly and unequivocally evinced.

With sentiments of the liveliest gratitude and esteem,

I am,

Dear sir,

Your obliged friend, and obedient servant,

JOHN REID.

Grenville-Street, Brunswick-Square,
February 5th, 1806.

PREFACE.

If, amidst the various modifications of disease incident to Man, there be one which claims a pre-eminent attention both from the medical profession and the public at large; it is that, the elucidation of whose nature, origin, progress, and treatment, constitutes the principal object of the following pages.

Scarcely, perhaps, a single individual could be selected out of the vast population of the British islands, who, in his own person, or in that of some near friend or family connection, does not feel a peculiar interest in the subject of Pulmonary Consumption.

 The

The importance of its subject precludes the necessity of apology for introducing the present Treatise to public notice. Its titlepage is a sufficient preface. "When the danger is general, admonitory writings cannot be too much multiplied and varied." This remark applies especially where misapprehension in judgment, or mistake in practice, are too often irremediable and fatal in their consequences.

With respect, however, to the manner in which such admonitions ought to be conveyed, an entire unanimity of sentiment cannot be expected. On this account it may be proper for the author briefly to explain the principles upon which his work has been constructed.

Medical dissertations have hitherto, with few exceptions, been exclusively professional, or entirely popular. While that liberal spirit of inquiry, characteristic of the present state of society, has in

a great

a great measure divested both general science and even practical art of mere technical and unmeaning expressions, the philosophy of medicine retains still too much of the antient barbarism of scholastic phraseology. Hence, in part, the extraordinary encouragement of empirical imposture. Scepticism is the offspring of concealment and mystery. It cannot be surprising that professional acquisition and talent are not duly appretiated, when a fair examination of their claims to attention is assiduously and fraudulently prevented.

The writer of the following pages has laboured to render the disquisitions that they contain at the same time open to general observation, and interesting to the professional student.—He has attempted to delineate a portrait, the prominent character of which shall be universally understood, while the more minute lines and shades of expression shall remain for detection by the skill of the artist.

In

In the dedication prefatory to Dr. Currie's Medical Reports, we find an express declaration of the author's wish to adapt his reasonings to general perusal, and that writer may appeal to the tribunal of public judgment with confidence and safety, the plan and object of whose exertions are authorized by the lamented biographer of the bard of Caledonia.

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In page 52, line 12 of the Note, og en *is printed for* oxygen.

ON

CONSUMPTION.

CHAPTER I.

INTRODUCTORY.

Diseases difficult to define.—Antient and modern theories of pulmonary consumption.—Principles of Brown.—Chemical physiology.—Order of the work.

VARIOUS attempts have been made to comprehend every variety of disorder in a general system of classification. In obedience, however, to a law of the animal œconomy, it is the tendency of disease, during its progress, not merely to change its form and shape, but to acquire a physiognomy and character directly opposite to that with which it first set out.

This

This circumstance considerably interferes with the accuracy of medical nomenclature, and renders the application of generic terms to the designation of particular disorders extremely difficult.

The word *phthisis* properly signifies a destruction or wasting; and, when confined or extended to pulmonary affection, denotes in medical language an ulcerated state of the lungs. When therefore we define pulmonary consumption, an expectoration of purulent matter which has been produced in the lungs, and is attended with hectic fever, it must be recollected, that the absolute existence of the disorder can only be predicated when these symptoms are actually present. In the case of extensive ulceration of the lungs, the disease is for the most part beyond the reach of medicine. On this account it must be obvious, that the delineation of what are termed consumptive symptoms consists principally of the history of preceding pulmonary disorders; and the means of preventing

the occurrence of the disease constitute the chief part of the method of treatment.

Respecting the origin of pulmonary ulcer, and its attendant symptom hectic fever, various conjectures have been offered. During the infancy of medical science, when rude and general observation supplied the place of correct anatomical research, and extreme ignorance prevailed with regard to the functions, structure, and several connecting parts of the human frame, the origin of purulent expectoration was attributed to an acrid corroding humour, supposed to be generated in the brain, and, falling down upon the lungs, gradually to penetrate their substance, and eventually destroy their texture. To this conclusion the antient theorists were led, from an observation of those affections which frequently precede or accompany the more obvious and decided symptoms of a catarrh or a cold, which last disorder is so frequently the præcursor of genuine or confirmed consumption. It may here be remarked, that

the vulgar opinion, even of the present period, with respect to the connection of what is termed *a cold*, and pulmonary discharge, is by no means greatly dissimilar to the above-mentioned hypothesis of the antient physicians.

When a more enlarged anatomical knowledge had demonstrated the impossibility of this imaginary communication from the brain to the lungs, and when at length the important discovery was made of the circulation of the blood, physiology began to assume a more favourable aspect; and those antient hypotheses, which were discovered to be inconsistent with several laws of the circulating system, were universally exploded. Still, however, the corruptions of loose analogical reasoning continued prevalent in the schools of medicine, and the science of life remained to be disclosed.

To enumerate the various hypotheses which, under the guidance of a false philosophy, and according to the imagination of their respec-

tive fabricators, have been at different periods. constructed, in order to explain the peculiarities of pulmonary consumption, were merely to present to the reader a long catalogue of absurdities, which would neither excite interest nor afford instruction. It may suffice generally to observe, that the existence of an acid or an alkali, of chemical acrimony or mechanical changes in the blood, of corroding volatile particles, and even of animalcula in the lungs, have been vaguely conjectured to be the cause of pulmonary ulcer and hectic fever. Still more recently this last has been attributed to an absorption of pus from the lungs into the circulating fluids; and by another writer to a retention of lymph, and that quantity of inflammable matter which during the healthy condition of these organs has been imagined to be constantly discharged*.

The errors and absurdities of medical spe-

* Essay on Phthisis Pulmonalis by Dr. Thomas Reid.

culations

culations on the causes of consumption and other diseases, are principally to be attributed to that total disregard, with which they have been characterized, of the peculiar laws that regulate the animate creation, and distinguish the phænomena of living existence from those of mere inert matter. Inductive philosophy had long been applied to the elucidation of almost every other branch of science except that of medicine. Theories of disease continued to be deduced from the principles of loose analogical reasoning; and unprofitable disquisitions into the *cause*, for a long period supplied the place of an attentive examination of the laws and characteristic qualities of vitality.

At length, however, the important desideratum was supplied. Boldly disengaging himself from the trammels of scholastic error, and disregarding the false glare of deceitful analogy, Dr. Brown sought an acquaintance with the laws of life by observing and generalizing its peculiar phænomena.

As frequent opportunities will be afforded in the course of the following pages to illustrate the great and important revolution which has been effected, both in the theory and practice of medicine, by the application of inductive reasoning to the science of life, and the doctrines of health and disease, it may not be improper to state the general outlines of the Brunonian doctrine, which, whatever may be its extravagancies or defects, is the only theory of medicine that in its first principles rests upon the firm and indestructible base of a genuine philosophy.

Every change which is effected on the solids or fluids of the living system is subordinate to, and consequent upon, a certain degree of action in the animate fibre. This action is produced upon principles entirely different from the impulse of mechanism, or the attractions of inanimate matter. It is governed by peculiar and exclusive laws. The powers by which it is generated are the

powers

powers by which life is sustained. Health consists in its regular maintenance. The various modifications of disease are in their origin entirely attributable to its derangement, and death is the inevitable and immediate consequence of the loss of susceptibility to its production. The principle by which the movements of the inanimate creation are regulated is termed gravitation. This is a term employed to express a demonstrated fact. In like manner, the principle by which living action is produced and directed is denominated excitability. The most prominent characteristic of excitability is, that its expenditure and accumulation are in the inverse ratio of the application of powers which excite into action the living fibre. This general law admits of, and requires, several very considerable and important modifications, some of which will be considered in the ensuing pages. It has been judged necessary to state the principal data upon which the

the system of Brown, "which is the philosophy of organized nature*," has been established, in order to render intelligible the remarks and illustrations which are to follow. It may be proper, before we conclude this general introduction, to observe, that a recent attempt has been made to found a doctrine of vital phænomena upon the basis of chemical union: the modifications of which excitability is susceptible, have been supposed explicable upon the principles of chemical attraction; and even the faculties of intelligence have been imagined to be capable of being resolved into the laws of chemistry†.

Several

* Villers on the spirit and influence of Luther's reformation.

† An example of the mode of philosophizing above referred to, is presented in the history of Galvanism.

The remarkable faculty possessed by the Galvanic principle of exciting the nervous fibre, has induced several

Several opportunities will be afforded the author, in the course of the present treatise, to introduce general remarks and strictures on this, what has been termed, chemico-animal physiology; and for the purpose of illustrating at the same time the extensive improvement which has been effected on medical theories and practice, from the application of modern chemistry, and likewise of censuring what he regards as erroneous in the deductions of certain physiologists of the present day, he

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several philosophers, particularly of the continent, to conclude that sensation, and other phænomena of vitality, are mere modifications of this power.

The author was much gratified in observing an account of a series of very elaborate and accurate experiments on this subject, by the ingenious Dr. Kellie, of Leith, in Dr. Duncan's Annals of Medicine for the year 1803; from which the following inference has been justly deduced, That Galvanism, "although it may hereafter throw some light on the chemical changes which take place in organized matter, is of no avail in explaining the *functions of life*."

intends

intends occupying a considerable portion of the work, by an inquiry into the *mode* in which the intimate relationship is established between living existence and external powers, more especially those by the irregular action of which consumption of the lungs is most frequently occasioned.

In the nosological arrangement of Dr. Cullen, phthisis pulmonalis is placed as a sequel of hæmoptysis, or discharge of blood from the lungs. Confirmed consumption, however, is frequently produced by the intervention of other disorders beside pulmonary hæmorrhage; on which account, after a general description of the anatomy and physiology of the respiratory organs, we shall delineate separately the characters of those affections of the lungs which are justly entitled to be considered as præcursors of this formidable and fatal disease. We shall then consider the nature of consumptive disposition, the mode by which such disposition is best obviated,

viated, and conclude by endeavouring to trace the steps of the malady during its more ordinary and insidious progress, when the preceding affections of the lungs are scarcely marked by characters of sufficient decision to authorise the affirmation of their existence.

CHAP.

CHAPTER II.

General anatomy of the organs of respiration.

PULMONARY disorders frequently originate from defective organization in the external structure of those parts that are subservient to, or connected with, the important and complicated function of respiration.

On this account it may not be improper to introduce a very general description of such parts, previously to delineating those which have a more obvious and intimate connection with the subject of most prominent consideration in the present treatise.

In anatomical descriptions of the human body, we find a division of its trunk into two portions,—the thorax forming the superior, and the abdomen the inferior part of this division.

The boundaries of the thorax exteriorly are,

are, however, not defined with sufficient precision to admit of accurate delineation. The two cavities of the chest and abdomen are formed by the intervention of a large and powerful muscle, (the diaphragm,) which is the organ principally concerned in the mechanism of respiration, and by the alternate contraction and relaxation of which, the dimensions of each cavity are materially affected.

The bones of the thorax, on the relative positions and strength of which depends its variety in form and magnitude, consist of the ribs situated laterally, the sternum or breast-bone occupying the anterior, and a number of the vertebræ or divisions of the back-bone the posterior part.

Of these several bones, the ribs alone are destined for any considerable motion in those alternate contractions and expansions of the thorax which constitute the act of respiration.

The breast-bone and vertebræ, in their relation

relation to the chest, are principally designed to give form, strength, and covering, to the thoracic cavity; and to serve as fulcra to the ribs, with which they are connected by distinct and moveable articulations.

It would be altogether superfluous, and foreign from the design of the present work, to enter into a minute description of the form and peculiarities of each of the bones above mentioned.

The reader, by recollecting the general situation, and relative position, of these osseous portions of the respiratory organs, will be prepared to understand the difference of structure which will be afterwards referred to and described, as constituting a variation in susceptibility to the causes productive of pulmonary diseases.

The external muscles, which are either remotely or directly connected with the function of respiration, are in general found to correspond, both in magnitude and strength, with the bones to which they are attached, and do

not admit of any description that would be intelligible to the general reader, or at all applicable to the subject of consumptive affections.

We shall now, therefore, proceed to a slight sketch of the internal structure and component parts of the pulmonary organs. The *lungs*, which occupy the principal portion of the cavity of the chest, are two soft spongy bodies, corresponding in figure with the osseous coverings of the thoracic viscera that have been just described. They are chiefly composed of cells: these cells are minute ramifications of the bronchia, which last are subdivisions of the trachea or wind-pipe, that long tube, composed principally of cartilaginous rings, which, commencing in the fauces, descends on the anterior part of the neck, divides primarily into two branches that supply each division of the lungs, by separating first into the smaller bronchial tubes, and ultimately ramifying into membranous vesicles or air-cells, that in this manner constitute,

as

as just stated, the principal portion of these organs.

Interposed, however, between these vesicles there is a quantity of cellular substance, which has no connection with the cavity of the air-cells, but connects these cells together, divides each lobe or lung into separate lobules, forms a surface for the innumerable divisions and almost inconceivably minute ramifications of blood-vessels that are every where dispersed over them, and gives strength and substance to the general structure of the lungs.

The blood-vessels of these organs, which, as will be shortly seen, are of such important consideration in reference to several functions of the animal œconomy, are formed by branches of the pulmonary artery and veins.

The trunk from which proceed the minute ramifications of the pulmonary artery, arises from the right ventricle of the heart, whose alternate and successive dilatations, and con-

tractions,

tractions, receive and propel every particle of circulating blood previously to its distribution throughout the body. Thus conveyed, by the contraction of the ventricle, and muscular power of the arteries, through their extreme branches, the blood is reconducted by corresponding branches of veins to the left auricle of the heart, to be carried, by means of a separate and distinct system of vessels, through the extensive course of general circulation.

Besides the parts already enumerated as entering into the composition of the lungs, these organs are likewise supplied with lymphatic or absorbent vessels, and with nerves.

We have represented the lungs as "two soft spongy bodies," which in anatomical nomenclature are termed lobes, and which are separated from each other in the manner now to be described. This separation of the respiratory organs, and the mode in which it is effected, we find it necessary to recollect, for the purpose of explaining several circum-

stances

stances in the pathology of disordered respiration, which would otherwise be obscure and inexplicable.

• By a membranous expansion of considerable strength, (the pleura,) the whole internal surface of the thoracic cavity is covered, and by a continuation, or reflection, of this membrane is divided into two distinct partitions, which are entirely without communication, and in each of which one of the lobes of the lungs is enclosed as in a separate and appropriate capsule: a further reflection of this membrane, by being expanded over its surface, furnishes an entire envelope to either lung.

Having thus described in very general terms the situation, form, and component parts of those organs, to the diseased affections of which our observations in the subsequent pages are principally to be directed, we might now proceed to consider the physiology

siology of respiration, as far as such inquiry may serve to explain the mode in which consumptive disorders are generated. As introductory, however, to this inquiry, it will be necessary to enter into a general account of the nature and properties of atmospheric air.

CHAP.

CHAPTER III.

Historical sketch of the progress of discovery with respect to the physical properties and chemical ingredients of atmospheric air.

"Aër omnia ambit, collustrat, *movet.*"

From the earliest periods of philosophical inquiry, the nature and properties of that invisible fluid which imparts animation, supports and regulates all living existence, and influences the whole phænomena of nature, have been the subject of speculative observation and scientific research.

In the writings of Aristotle, whose system of philosophy, among the antients, was most conspicuous and prevalent, we find the material universe divided into four elements; and the atmospherical fluid regarded as con-

constituting one of these elementary divisions.

Air is imagined, in this system, to be a kind of intermediate existence between fire and water, partaking in some measure of the aridity of the former and humidity of the latter.

It is worthy of remark, that the vulgar conceptions of the present day, with respect to elementary bodies, coincide, in a great measure, with the Aristotelian philosophy; and fire, air, earth, and water, are considered, in general, as distinct, independent, and elementary existences.

A mode of philosophizing fundamentally erroneous continued prevalent in the schools until the time of lord Verulam, who, by "his masterly Survey of Universal Science," directed inquiries respecting the varied phænomena of nature into appropriate channels, and evinced the fallacy of those researches in every department of knowledge that had reference to abstract and occult causes.

The

The development of the principles of Bacon constituted the dawn of true science. The physical properties of the atmosphere became now the objects of philosophical inquiry, and important discoveries resulted from the well-regulated labours of the natural philosopher. The discovery of the gravity of the air opened a wide field for observation and experiment; and its density, elasticity, and various other properties, became generally known and applied to the explication of effects, that were previously in the most vague and indecisive manner referred to abstract and occult agency.

During the space, however, of more than a century, the researches of the philosopher in this department of scientific inquiry were principally directed to the mechanical properties of the surrounding atmosphere; and many erroneous applications were made, during this period, of such properties to the physiology of animate existence. To the most prominent of these errors we shall have

an opportunity of referring, when treating of pulmonary hæmorrhage, a frequent source of true consumption.

The alteration, however, which the air undergoes in the process of respiration, was not entirely disregarded in the period to which we have referred; and in the writings of Mayow, who was cotemporary with Boyle, we find anticipated, in a certain degree, the brilliant discoveries of modern chemistry.

In tracing the history of science, the inquirer will frequently observe, in the earliest records, intimations of an acquaintance with those principles, the full enunciation and extensive application of which are reserved for future and more enlightened periods.—"Something very like the Newtonian system of attraction and gravitation *" has been traced by antiquarians in the remotest periods of eastern philosophy. In the nitro-

* Vide Maurice's Preface to Indian Antiquities, page 75.

aërial particles of Mayow a similar anticipation may be observed, both of the chemical nature and physical properties of the oxygen gas of modern times. The germ, however, of true knowledge respecting the composition of the atmosphere, required for its expansion and growth that culture which it has received from an application of the genius and industry of the present day*.

The celebrated Dr. Black, late professor of chemistry in the university of Edinburgh, by his important discoveries of the fixidity of air, the existence of gaseous substances of a certain kind in a concrete state, and the re-

* There has been much variety of opinion respecting the claims of Mayow to a knowledge of the composition and properties of atmospheric air. Dr. Yeats, of Bedford, has considered this philosopher to be the actual discoverer of oxygen. Dr. Bostock, however, very justly remarks, in reference to this subject, "that expressions which appear to coincide remarkably with the modern discoveries would not suggest the idea of these discoveries to one who was previously unacquainted with them." Vide Bostock on Respiration, page 201.

markable fact, which will be referred to in the succeeding chapters, respecting the varied powers of heat in raising the temperature of different bodies, may with propriety be regarded as having developed the fundamental principles from which have proceeded the late astonishing and rapid improvements in the general doctrines and science of chemistry.

The atmosphere began now to be viewed as a compounded body; and by the ingenious and laborious experiments of Cavendish, Scheele, and Priestley, its component principles were gradually unfolded, and at length fully ascertained.

It was, however, reserved for the celebrated Lavoisier, the lamented victim of inhuman policy and tyrannical power, to state with philosophical precision and accuracy the constituent ingredients of atmospheric air*.

It

* Lavoisier was engaged in a series of elaborate experiments when he received sentence of death by the command of Robespierre. He requested a respite of a few days to ascertain the result of the most important

of

It had long since been observed, that immediately after the process of deflagration or combustion of any body in a given quantity of air, the matter which had been the subject of experiment was considerably increased in weight; at the same time the air was rendered impure, and incapable of again supporting a similar process. Such augmentation in weight had been indecisively referred to aërial absorption; but while the atmosphere was regarded as an homogeneous body, the mode in which such absorption was effected, and the nature of the matter absorbed, were altogether inexplicable.

When the celebrated philosophers whose names we have already mentioned, and among whom the late Dr. Priestley occupies the most conspicuous rank, had observed the effect in question,—a solitary example of the many processes by which the atmospheric air under-

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of these experiments; which grant was refused him! "France," said the tyrant in reply to his request, "requires patriots, and not philosophers."

goes a perpetual modification,—they attributed the mutual alteration of the air and deflagrated substance to the abstraction of a peculiar principle previously existing in such substance, but which, during the process, had been imparted to, and now become a constituent ingredient of, the air employed in the experiment. This imaginary principle was denominated phlogiston, and the impure air thus generated was called phlogisticated air.

The assumption of undemonstrable principles is an important error in philosophizing. Those explanations of facts can never be regarded as satisfactory that are founded upon gratuitous admissions. The phlogistic theory, which originated with Stahl, and which had been so generally received until the time of Lavoisier, was now overturned, and an entire regeneration in the doctrines of chemistry was effected by the experiments and observations of this distinguished philosopher.

It had been observed that the air was not only rendered impure by the process already referred to, but that such impurity was connected

nected with a diminution of its specific gravity*. This fact alone appeared to afford sufficient evidence of the invalidity of that mode of reasoning which had been employed by the phlogistic theorists. But by numerous experiments, both analytical and synthetic, instituted and repeated with such attention and accuracy as to obviate objection and preclude doubt, the weight acquired by the deflagrated material was found to be in the exact ratio of what had been lost by the air during the process of deflagration.

By these experiments the doctrine of phlogiston was proved to be not merely unsatisfactory and imaginary, but directly contrary to truth. In the material which was supposed by the phlogistic theorists to have been deprived of a principle upon which its inflammability had depended, a considerable

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* The term specific, applied to weight, denotes the relative gravity in an equal bulk of any substance to another, the absolute weight of which is regarded as a standard.

augmen-

augmentation of weight was demonstrated; and, on the contrary, in the atmosphere, which according to these theorists had been supplied with an additional principle, a proportionate diminution of gravity was proved to be occasioned.

With the doctrines, the nomenclature of chemistry was now likewise entirely reformed. The dephlogisticated air of Scheele and Priestley became the oxygen gas of the French chemists, and the composition of the atmosphere was at length decisively established.

By the above historical sketch, we have in some measure anticipated our statement of the component parts of atmospheric air, which is formed of two radical and essential principles, oxygen and azote, existing in the atmosphere in a gaseous condition, but each capable, by certain processes, of combination with solid bodies, or of reduction from its elastic aëriform state to that of firmness or fixidity. The latest and most accurate experiments

periments instituted for the purpose of ascertaining the relative proportion of these constituent ingredients "agree in indicating the proportion of oxygen to azote to be nearly as 22 to 78."

Besides these gases a third is almost invariably found present in the atmosphere; but, on account of the comparative minuteness of its quantity, and other circumstances, this latter gas, which is the carbonic acid gas of modern chemists, is for the most part regarded as an extraneous principle.

With a general account of the manner in which the analysis of atmospheric air is best effected, and of the most remarkable sensible qualities possessed by each of its constituent parts, we shall conclude the present chapter.

The processes of deflagration and combustion, as being the most familiar, have been chiefly referred to in our endeavours to illustrate the principles of the new chemistry. In consequence, however, of a circumstance immediately to be explained, such processes afford

a more

a more complicated, although not less decisive, result. The oxygenous portion of the atmosphere is separated from the azotic, and obtained with greater facility by the calcination of metals, as of mercury—the material first employed by Lavoisier. By confining a certain quantity of this metal in a given portion of atmospheric air, and increasing its temperature, he obtained the whole of the oxygen contained in this quantity of air which was absorbed by the metal,—and again, by other processes, extricated and made to assume a gaseous and independent existence. In this manner was obtained pure and unmixed oxygen gas, in which "a taper burnt with a dazzling splendour; and charcoal, instead of consuming quietly as it does in common air, burnt with a flame attended with a decrepitating noise, like phosphorus, and threw out such a brilliant light that the eyes could hardly endure it*." This gas when inspired pure increases the *action* and general heat of the

* Lavoisier's Elements of Chemistry, by Kerr, p. 84.

system

system, and has been known to produce an inflammation in the lungs.

Azotic gas is the residuary air after the experiment above related has been brought to a conclusion. By other processes, however, which it were unnecessary to describe, this gas may be obtained in greater purity, and without any admixture with foreign principles. The qualities of this air are the reverse of the former. Combustion, instead of proceeding with increased splendour and rapidity, is altogether incapable of being maintained by azotic gas; and almost immediate extinction or destruction of the vital principle is consequent upon its employment in respiration.

The remaining principle, or carbonic acid gas, when inhaled pure is equally and perhaps more speedily destructive of life. This gas is produced by combustion as well as by various other processes; and it is this circumstance that renders combustion a more complicated process with respect to the analysis of air than calcination and some others. Carbonic

bonic acid gas is the spiritus sylvestris of Paracelsus, the gas sylvestris of Helmont, and the fixed air of Dr. Black. On its various and remarkable properties and combinations it is not our province to enlarge*.

* In describing the deleterious effects of azotic gas, the author employed the terms "*extinction* or *destruction* of the vital principle," as it is still a point in controversy whether noxious gases display their agency on the system by virtue of a positive or negative property. Analogy perhaps fully justifies the former conclusion. There have been numerous instances of an instantaneous deprivation of life from inhaling carbonic acid gas; and the highly stimulating power of this last, when taken either into the lungs or stomach in small quantities, has been established by many decisive experiments.

CHAPTER IV.

Respiration.—Connection of this function with animal temperature.—Objections to the chemical theory of animal heat.—General observations.

"A knowledge of the laws which regulate the vital heat seems to be the most important branch of physiology."

Dr. Currie's Medical Reports, p. 265.

THE anatomical description of the respiratory organs in the second, and general account of the nature and chemical composition of the atmosphere in the third, have prepared the reader for the cursory remarks that are to be introduced in the present chapter with respect to the physiology of respiration.

It is to what has generally been regarded as the chemistry of respiration (if he be allowed

lowed the expression) that the author purposes to confine his observations;—the consideration of the mechanism of this important function would be improperly admitted into the present work.

Into those cells which we have already described as constituting the principal portion of the substance of the lungs, is constantly admitted, and from them immediately expelled by the alternate acts of inspiration and exspiration, a certain quantity of air. By this process the air undergoes a very considerable alteration. This circumstance, as stated in the preceding chapter, had been long the subject of observation; but previously to the development of the atmosphere's constituent principles, the precise nature of the change effected was by no means understood.

The noxious and unrespirable quality of air ejected by the lungs at each exspiration; is at length ascertained to be of less considerable import in explaining the function of respiration, than the difference in specific gravity

vity of an equal volume of air previous to, and after it has been employed in, this process. The great discovery of Dr. Black, referred to in the preceding chapter, first directed the attention of the physiologist to this important circumstance; and the modern doctrines of respiration, in their general outline, are almost entirely resolvable into this fundamental truth, as the grand principle from which they have been deduced.

Previously to engaging in a general disquisition on the nature of the change which the air undergoes from its reception into the vesicles of the lungs, it will be necessary to acquaint the reader with the nature of this important discovery.

Bodies, in passing from one form to another, impart more heat to the atmosphere, or other bodies with which they may be in contact, than their temperature previously indicated them to possess. There is, in other words, a variation in the capacity of bodies for containing heat, independently of the apparent heat of such bodies displayed

played by the sensations, or tried by the infallible test of thermometrical experiment. This singular and important fact it will be necessary to illustrate by example.

If a certain quantity of water be heated to that point at which, under the common pressure of the atmosphere, it is incapable of receiving a larger portion of calorific matter while retaining the form of water, and a greater heat be now applied, the temperature of the water will not, by such augmentation, be in any measure increased, but the additional quantity of heat that may be imparted will pass off in the form of steam; or, in other words, the water, being incapable of combining with more than a certain portion of caloric*, will be immediately converted into the form of vapour to adapt itself to its present exigencies. It is evident from

* This term was first employed by the French philosophers to distinguish accurately the matter of heat, or the cause producing the phænomena of heat, from the mere sensations excited by this power.

this experiment, that steam, which is no other than water with its constituent particles separated at a more considerable distance, has a greater capacity for heat than water. But this capacity is rendered altogether unequivocal by the circumstance of a much larger quantity of heat being thrown out from steam in its reduction to water of a certain temperature, than would be imparted to surrounding media by reducing an equal weight of boiling water to the same temperature to which the steam had been lowered. The water, however, is capable of still further reduction, and may be converted by artificial processes, or by the agency of nature, into that state of congelation or approximation of its particles which constitutes ice. But what, perhaps, is still further illustrative of the effect in question; water may by certain means be cooled below the temperature at which it naturally congeals, indicating to the sensations and to the thermometer a heat inferior to that of ice—in common language, being actually colder than ice, when by agitation,

tation, or other methods employed to reduce it to this state of greater solidity, its temperature will immediately rise, the ice formed will impart more warmth to the feelings than in its state of fluidity, and during the process a large quantity of calorific matter will be extricated, which, were the experiment conducted with due precaution, would be found in the exact ratio of the comparative capacity of water and ice for containing heat: in other words, the latent or combined heat of the water will be rendered sensible, and given out to the surrounding media.

The principle, however, by which the heat of bodies is regulated, may be more fully although less familiarly illustrated, by recalling to the reader's mind what has before been observed respecting the mutual alterations that occur in a deflagrated material, and the atmospheric air that has been necessarily employed in the process of deflagration.

The body has been *increased* in specific gravity in the exact proportion to the *diminution* of the air. The pure or oxygenous

principle

principle of the atmosphere has lost its gaseous and assumed its concrete form, and the latent or combined heat which was absolutely requisite to the maintenance of the gaseous condition of the oxygen is dissipated.

The above preliminary observations have been introduced, for the purpose of rendering more intelligible the general remarks that are now to be presented to the reader on the subject of respiration as connected with animal temperature.

Since the important fact has been ascertained, that the heat of animate bodies is pretty equally preserved during every variation of external temperature, various endeavours have been made to explain this remarkable characteristic of vitality*.

"Modern

* The common heat of the human body in health is 98° of Fahrenheit's thermometer; and this degree of heat is preserved, with trivial variation, provided the system continue in health, notwithstanding the great alteration

"Modern chemistry assumes to itself the discovery of the origin of animal heat*." The general principles on which this assumption is founded we are now prepared to consider.

It has been ascertained from experiment, that by the capacity of the pulmonary organs for receiving and decomposing air is animal temperature principally regulated. Birds, whose lungs are far superior in comparative magnitude to those of quadrupeds, have, in a similar proportion, a higher degree of animal heat. Fishes, and those animals that are not supplied with respiratory organs, have a general temperature scarcely superior to that of the medium in which their existence is maintained. These are the principal facts on which have been founded the modern doctrines in relation to the means by which animal heat is generated and preserved.

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alteration in external temperature to which we are constantly exposed.

* Dr. Currie's Medical Reports, third edition, p. 265.

During

During the prevalence of the phlogistic theory of chemistry, or when the several processes by which the air is corrupted were referred to the communication and interchange of phlogiston, or the principle of inflammability, Dr. Adair Crawford published his ingenious observations on the subject of animal heat; in which he endeavours to prove, that in the act of respiration the pure part of the atmosphere taken into the lungs combines with the phlogistic principle which the blood has acquired in the course of circulation; that by such combination latent heat is rendered sensible, received into the system, and in this manner becomes the perennial source of animal temperature. The reader acquainted with the general principles of the new chemical nomenclature is aware that the hypothesis of Dr. Crawford, without virtual alteration, is susceptible of a more accurate statement. The oxygenous or vital part of the atmospheric air is supposed in its passage through the lungs to leave its aëriform condition, becoming concrete, to combine with

with the blood circulating through these organs, and in the moment of combination to give out the latent caloric that it had previously possessed, which is the animal heat of the general frame.

However beautiful in structure this theoretical edifice may appear to those physiologists who refer all the phænomena that characterize living existence to the agency of chemical attraction or repulsion, the basis on which it is established may perhaps prove to be composed of materials not entirely indestructible. In a full and formal examination of the hypothesis in question, several objections might be urged against its validity, that would, however, be altogether irrelevant to the general design of the present work.

The radical and important error in the reasonings of that physiology which is so fashionable in the present day, appears principally to consist in the admission and application of gratuitous principles that proceed from the impure source of general analogy.

In the processes of both respiration and combustion,

combustion, oxygen gas is absorbed. On this account respiration has been imagined to be a species of combustion, and the reasonings which were satisfactorily applied to the explication of the one, have been precipitately made use of as suitable to the other.

Without in the present instance introducing any further remarks in defence of that system to which the author has already referred in the introductory pages, he may here be permitted to observe, in illustration of his principles, that the intermediate link of excitability has been too much disregarded in the endeavours of the modern physiologist to unite by one connecting chain the multiform and diversified series of events that are respectively characteristic of life, and of mere inanimate existence.

The regular preservation of heat in a due and equal degree throughout every part of the animate frame may, perhaps, with propriety be urged as a considerable objection against the generally received theory of the manner in which such heat is propagated and

preserved.

preserved. The alterations which occur in every form of mere inanimate matter effected by the agency of external and partial application, with whatever rapidity they are generated, must necessarily be occasioned in succession. If, therefore, the vital fluid in the course of circulation receive at a certain stage of such course a supply of heat, which is to be gradually imparted to the system; or if the blood during its circulation "absorbs by little and little a portion of hydro-carbonate, (carbon and hydrogen,) parting with caloric in the same proportion," instead of an "uniformity of temperature" being preserved "throughout the body," different portions of the system would be heated in varied degrees and at different times. In reply to this objection it may be urged, that nearly in proportion to the proximity of parts to the great centre and source of circulation, is the temperature of such parts. This circumstance, however, is in reality an objection to the hypothesis in debate; for that portion of blood which has received its full supply of hydro-carbonate, and has consequently parted with all or the greater

part

part of its caloric, would be considerably diminished in temperature, would be itself cold, and generate cold in the parts through which it circulates. The right or anterior auricle of the heart ought upon these principles to be constantly at a temperature by far inferior to that of the extreme parts of the body, and the regions in its vicinity of a heat proportionably small. This objection might be urged in a variety of forms, and extended to a considerable length. As, however, it forms no part of the author's design, to engage in an elaborate disquisition on the doctrines of respiration, he will hastily pass on to the conclusion of the present chapter, by presenting to the reader one or two further remarks in reference to the subject in question.

The varied phænomena that are displayed in the different stages of pyrexial fever*, appear to oppose themselves forcibly to the admission of Dr. Crawford's principles. In the

* The epithet pyrexial, as employed to denote a certain kind of fever, will be explained when the peculiarities of *hectic* or consumptive fever are under consideration.

course of a febrile paroxysm, there is an alternation of cold and heat, apparently independent of the respiratory organs. During the first or cold stage of an intermittent, the salutary functions of the general frame are considerably impeded, the usual *motions* of the system are interrupted or partially suspended, and cold is generated. In the succeeding period of the paroxysm, every thing is reversed. Morbid *action* succeeds to temporary suspension, and the temperature of the frame is now augmented in a degree proportionate to its previous reduction. The spasmodic or oppressed breathing that occurred in the first, shall, however, be continued, if not increased, during the second stage, and shall only be subdued with the subtraction of part of the heat generated by the disordered actions that had constituted fever.

It may further be remarked, that those persons who from trivial causes are subject to febrile irritation, and consequent increase of heat, are those who for the most part have lungs of an inferior capacity, and who consequently

quently decompose less than the ordinary quantity of air at each inspiration.

From these and other facts, which might be stated in an extended dissertation on the subject of animal heat, the author infers, that the alteration which the blood undergoes in the course of its circulation through the lungs is rather to be regarded as an indirect than immediate source of the result in question; and that the cause of constancy and equality in the respective temperature of different animate bodies is to be sought for in the incessant actions that characterize vitality, and which are generated *immediately*, and throughout the whole frame, in consequence of the appropriate operation of the various exciting powers on the irritable principle, of which the process of respiration is incalculably the most important and indispensable. When such exciting powers exert their influence in an undue degree, being either deficient or in excess, a species of vibratory motion is generated in place of the regular and appropriate actions which constitute health, and

 preserve

preserve an equably diffused heat. Of such irregular motions, febrile or inordinate heat is the consequence*.

That portion, then, of the air which is received into the lungs at every inspiration, and rendered concrete in these organs, is to be regarded as operating in the preservation of animal temperature by virtue not of its chemical agency, but in common with other stimuli upon which the regular and healthy functions of the animate machine are momen-

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* The author by no means wishes to establish the principle of entire similarity, either in nature or in result, between the motions generated by the operation of extraneous powers on the living system and on dead matter. But that an increase of *action* is attended in each instance with an augmentation of heat, it is presumed, no one will question. Indeed, so invariable are these consequences—heat from motion, and cold from quiescence—that some authors have been induced to deny that the cause of heat is a material substance, and to maintain that caloric is itself a species of motion. This doctrine has been supported with great ingenuity by count Rumford.

tarily

tarily dependent; all of which are similar in kind, but extensively varied in power, and likewise in their mode of operation.

By the admission of this principle of agency in the absorbed oxygen and other constituent parts of the atmosphere, we are enabled to account for the *immediate* and equably diffused operation of each inspiration, and to solve the difficulty necessarily attendant upon the chemical theory of animal temperature, which, independently of various other effects, fails in accounting for this, the principal circumstance in that remarkable and important phænomenon; on which, as it has been very properly remarked, "a definition of life might be established*."

In conclusion, it may be observed, that the extensive improvements in chemistry in their application to the philosophy of *life*, can merely be instrumental by enlarging our sphere of knowledge with respect to the action of exciting powers on the irritable or vital principle.

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* Currie's Medical Reports.

Animate and inanimate nature cannot be made to amalgamate, even in the ingeniously constructed crucible of the modern chemist. "Man has been restored to his proper station in the centre"—a station which he will obstinately and proudly maintain, notwithstanding the powerful allurements of chemical attractions*.

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* In the very slight sketch which the author has taken of the modern doctrines on the generation of animal heat, the generally received hypothesis respecting the chemical origin of the aqueous vapour discharged by the lungs in respiration has been supposed. The emission, however, of hydrogen from these organs, and the acquisition of carbon in the course of circulation, have recently been questioned; and the pulmonary vaporous exhalation has been supposed to be a species of perspiration. By this constant evaporation from the surface of the lungs, the heat extricated from the condensation of ogen may, perhaps, in a great measure, if not entirely, be absorbed, and thus the *independent stimulating* agency of condensed air be more firmly established.

If the reader be desirous to inquire particularly into the subject of respiration, as connected with animal temperature, the author refers to the very able and elaborate Essay on Respiration, by his friend Dr. Bostock, of Liverpool.

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CHAPTER V.

Cutaneous perspiration.—Its connection with the temperature of the body particularly illustrated by Dr. Currie.—General remarks on the qualification required in the reception of this *doctrine.*

THAT various processes take place in the animate body, which with respect to their partial operation deserve to be regarded as strictly chemical, the writer of these pages by no means intends to dispute. From the cursory remarks which have been offered in the preceding chapter on the subject of respiration as connected with animal temperature, it will be seen, that the advantages derived from what the author considers an appropriate application of the doctrines of chemistry to the science of living existence are admitted in all their extent. While, however, the utility is acknowledged of chemical physiology, both as it relates to the philosophy of life and the origin and nature of several disordered affections,

tions, the combinations of chemistry ought always to be regarded as subordinate to, and effected by, the agency of the vital principle*.

From the subject of respiration as connected with animal temperature, the author now proceeds to present to the reader's attention a few cursory remarks on the cuticular discharge, as it stands in relation to the heat of the body. On this, as on the preceding topic of discourse, his observations will be equally general.

Perspiration is a process in the animal œconomy that has in all ages justly excited the attention of the physiologist. In the introductory pages of the present treatise, some of the most obvious errors of inquirers into this subject have been adverted to, and the principal source of such erroneous reasonings has been pointed out. To some of the laws regulating animal perspiration, allusion will

* "The evolution of active heat in the system appears to be modified by the living power on its own peculiar principles." Dr. Currie's Reports, page 212.

again be made in treating on catarrhal disorders; and we now propose to confine our observations on this function to its supposed or real connection with the process of respiration.

Dr. Currie has ingeniously conjectured that the cutaneous discharge is principally designed by nature for the purpose of reducing and regulating animal temperature. On this account he imagines perspiration, acting as the converse of respiration, to be of nearly equal importance with this last-mentioned process in the regular maintenance of internal heat. The following are his words: "As in respiration a gas is constantly converted into a solid or fluid, and thus heat evolved, so in perspiration a fluid is continually converted into a vapour, and thus heat is absorbed*."

Of

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* Vide Currie's Reports.

The author is aware that the doctrine here referred to has been promulgated and supported by other writers previously to the appearance of Dr. Currie's work. The relation, however, of these two functions

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Of the cooling influence of perspiration, the feelings of every individual are sufficiently accurate to convey a certain degree of information. Although, however, the effect be generally known, that in the majority of instances moisture on the external surface of the body is attended with the sensation of cold, the principle upon which such feeling is generated is not, it may be fairly presumed, so universally understood. It will, therefore, be proper to premise a few words in explanation of the manner in which the sensation of cold is frequently occasioned.

It has already been fully shown that the capacity of different substances for combining with calorific matter is extremely varied. It may, however, be stated as a law, admitting but of very trivial exception, that in proportion to the rarity of any species of matter will

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of pulmonary inhalation and cuticular exhalation had not been hitherto treated of with any degree of accuracy. Dr. C., therefore, may with propriety be regarded as the founder of the theory.

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be its quantity of latent or combined heat. Absorption of heat and rarefaction are nearly synonymous and convertible terms. When a body existing in that condition to which the expression of fluidity is more generally applied passes into an aëriform state, such body at the same moment acquires a larger capacity for, and receives an additional quantity of, calorific matter. This circumstance was sufficiently illustrated in the preceding chapter. It is here again adverted to, for the purpose of explaining the manner in which cold is generated by the process of evaporation. When on the surface of any inanimate material at a given temperature a quantity of fluid is placed that enters with facility into the state of vapour,—during its conversion from the former to the latter condition of existence, heat will be extricated from the material with which the fluid had been in contact, to enable such fluid to acquire and preserve the form of vapour. Cold must necessarily be generated in the sub-

stance from which caloric has been, extricated in the exact proportion to the loss sustained*.

Thus, then, we have fully explained to us the rationale of evaporation as a refrigerating process, and thus, in part, are we enabled to account for the sensation of cold as consequent upon perspiration. When the matter of sweat is poured out upon the surface of the body, it is very shortly dissipated in the form of vapour: the production of this vapour is occasioned by the heat of the surface on which the perspirable fluid has been thrown out, and therefore the feeling of cold is necessarily generated.

The celebrated experimentalist of America, Dr. Franklin, paid particular attention to this circumstance; and the following is the

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* The powerful effects of evaporation in generating cold are beautifully shown by the artificial methods of forming ice. In eastern countries this process is conducted on a very extensive scale. For further illustrations of the influence of evaporation on the œconomy of nature, the reader is referred to the different elementary treatises on chemistry.

relation

relation given by this philosopher, which the author takes the liberty of extracting from the work of Dr. Currie, to which he has already referred :—

"During the hot Sunday at Philadelphia, in June 1750, when the thermometer was up at 100° in the shade, I sat in my chamber without exercise, only reading and writing, with no other clothes on than a shirt and pair of long linen drawers; the windows all open, and a brisk wind blowing through the house: the sweat ran off the backs of my hands, and my shirt was often so wet as to induce me to call for dry ones to put on. My body, however, never grew so hot as the air or the inanimate bodies immersed in the air, being kept cool by the sweating, and the continued evaporation of that sweat."

Such, then, are the facts upon which has been founded the doctrine that perspiration, in a chemical point of view, is the converse of respiration, and that the evolution and regulation of animal heat is principally dependent upon its agency. Notwithstanding, however, the

the great mastership of reasoning displayed in support of this hypothesis by its illustrious framer, the writer of these pages presumes that there are several objections which formidably oppose themselves to its entire reception. Dr. Currie admits that "the temperature of the body is with difficulty increased (even when immersed in the hot bath) after the sweat begins to flow profusely;" and to obviate this apparent objection to the validity of his theory, he, with his accustomed ingenuity, supposes, "that in the *production* of sweat itself," previous to its appearance on the surface, "a degree of heat is absorbed." To the author, however, it appears that the reduction of temperature here alluded to, or rather its regulation, is in a great measure independent on the quantity of perspirable matter which may have been generated; that sweat is to be regarded rather as a consequence than cause of the equality of temperature, after the heat of the system has arrived at a certain point; and that both the one and the other are principally influenced not by chemical

laws,

laws, but by the excitement of the whole frame.

In support of this opinion, he observes in the first place, that the cooling influence of certain powers productive of sweat is frequently perceptible not only previously to the appearance of moisture on the external parts of the body, but that such powers frequently exert their refrigerating influence without occasioning any perceptible perspiration, and often operate so rapidly in reducing the heat of the system, as to prove that the effect is entirely independent of chemical agency. It is a curious and important circumstance in the animal œconomy, that contrary effects may be produced by precisely the same agents. Ablution of the surface of the body with tepid water under certain circumstances of the system will generate, and at other times will dissipate, heat. In cases where the vital power is extremely weak, but where the heat of the general frame is superior to its ordinary standard, this remedy, properly applied, will refresh, animate, and at the

the same time cool the patient. The inhalation of a purer or more oxygenous atmosphere than ordinary will increase the general action and heat of the system, if employed in respiration by a person whose health and strength are not in any measure impaired; but fresh air, and even oxygen gas, by virtue of its stimulating power, will dissipate the inordinate heat of a typhoid or low nervous fever. The effects of these agents in either case will generally be displayed instantaneously; and if sweat be occasioned by their operation, its appearance for the most part is subsequent to their cooling influence. It has indeed been ascertained by experiment, that, even in instances of the termination of a febrile paroxysm, the sweats that have been imagined to occasion the reduction of temperature do not occur till the skin is cooled from 112 to 108 degrees of heat; that is, till the paroxysm begins to decline*: and hence the

* Darwin's Zoonomia, vol. ii. page 20.

conclusion

conclusion is altogether justifiable, that the moisture on the external surface is rather a consequence than cause of the cessation of disordered actions, upon which had depended the generation of heat, and which, with the inordinate heat thus induced, have been counteracted by the appropriate application of stimuli.

A second argument against the cutaneous discharge operating principally upon chemical principles, in regulating animal temperature, is furnished by the following fact, that "a double quantity evaporated by the insensible perspiration makes no alteration in the heat*;" because in this case the frigorific power of the evaporating process is invariably counteracted by the increased actions that were necessary to the production of this augmented quantity in the cutaneous discharge.

By the physiologist from whom the author

* Fordyce's Elements of the Practice of Physic, part i. page 48.

has

has extracted the preceding fact, the following observation is indeed presented in the form of an axiom—"that the heat is not at all in proportion to the evaporation." A remarkable circumstance may here be stated in illustration of this principle, and of the different laws by which animate and inanimate existence are regulated: viz. with cold dry winds blowing from the east, where the process of evaporation, in consequence of the air's dryness, proceeds with a rapidity more than proportionate to the temperature of the atmosphere, febrile or inordinate heat is extremely frequent*.

The

* Dr. Gregory of Edinburgh is accustomed annually to relate in his lectures an accidental observation which he made on the remarkable properties of a cold easterly wind in rapidly reducing the bulk of gunpowder; an effect solely consequent upon the celerity of evaporation. The following relation of the late Dr. James Hutton of Edinburgh is fully illustrative of this principle: "I used to amuse myself, in walking in the fields, by observing the temperature of the air with the thermometer, and trying its dryness by the evaporation

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The different sensations produced according to the varied conditions of the system by an equal quantity of perspirable matter, may perhaps with propriety be adduced as a further argument in support of the doctrine of excitement as opposed to that of direct and exclusive chemical agency. In certain forms and periods of disease the patient shall

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of water. The method I pursued was this: I had a thermometer included within a glass tube hermetically sealed: this I held in a proper situation until it acquired the temperature of the atmosphere; and then I dipped it into a little water also cooled to the same temperature. I then exposed my thermometer with its glass case thus wetted to the evaporation of the atmosphere, by holding the ball of the thermometer, or end of the tube in which the ball was enclosed, towards the current of the air; and I examined how much the evaporation from that glass cooled the ball of the thermometer which was included. During the summer season, in the dryest weather that I could find, I never sunk the thermometer in that manner, to the best of my remembrance, above two, three, or four degrees. But in a cold east wind, in the spring, I once sunk it between nine and ten degrees."

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be "bathed in sweat," without experiencing relief from his irritating and burning sensations; while, under different circumstances of the frame, an equal quantity of perspirable matter shall be poured out on the skin cold, clammy, and fœtid*.

From these and other circumstances connected with the phænomenon of cutaneous perspiration, the author infers, that this process deserves to be regarded rather as an effect, than viewed as a cause of the regular and appropriate action or excitement of the living fibre.

This conclusion merely applies to the office of the cutaneous discharge considered as a chemical agent. The necessity of its regulation and constant preservation will be enlarged on in the course of our inquiries respecting the method to be pursued for the purpose of

* The refreshment attendant on perspiration, however copious, when artificially and forcibly produced, is always inferior in degree to that generated by the regular and salutary process of nature.

preventing

preventing the occurrence of pulmonary disorganization, particularly while considering the subjects of warm and cold bathing.

Notwithstanding the very general manner in which the subjects treated of in the two preceding chapters have been investigated by the author, his inquiries may perhaps appear to some of his readers to have conveyed him beyond the boundaries prescribed by the title-page of the present work. The obvious connection, however, of the pulmonary system both in its healthy and deranged condition with the heat of the general frame, the absolute necessity of sedulously attending to the temperature of the body for the purpose of counteracting a disposition to pulmonary disorders, and the assistance that may be derived from such attention in the medicinal treatment of the consumptive invalid, must form his apology for slightly engaging in discussions that at first view may appear of an irrelevant

irrelevant nature—an apology, the necessity of which, he hopes, will be in some measure superseded, as the reader shall accompany the author through the respective stages in the remainder of his course.

CHAPTER VI.

Hæmoptysis or pulmonary hæmorrhage—frequently, but not invariably, precedes consumption.—Symptoms.—Causes.—Method of treatment.

From the anatomy and physiology of the pulmonary organs, the reader's attention is now to be transferred to their respective disordered conditions, as far as such disorders have relation to genuine consumptive affections.

The inaccuracy of Dr. Cullen's classification in the instance of consumption, and the necessary defects attending nosological arrangement in general, have already been the subjects of remark. Genuine phthisis, so far from occurring invariably as a consequence of pulmonary hæmorrhage, frequently, and for the most part, originates without the intervention of actual or decided disease. The insidious approach of consumption

sumption of the lungs constitutes, indeed, its principal characteristic. The fabric of the constitution is frequently destroyed by its foundation being gradually and imperceptibly undermined. The disorder has often been firmly rooted in the system before the superficial observer has even suspected its existence. Not unfrequently, however, pulmonary consumption is preceded by other affections. To these, sedulous attention must be given; and it will perhaps be more advantageous to acquaint the reader with their general character, and the treatment which they require, than immediately to proceed in detecting the more secret, silent, and circuitous march of this destructive enemy to the human race.

Dr. Cullen enumerates five different affections as capable of producing ulceration or confirmed consumption of the lungs. These may perhaps with propriety be reduced to four—hæmoptysis, catarrh, pneumonia, and tubercles. To the consideration of each of these a separate chapter shall be devoted.

SECTION I.

Symptoms and general character of hæmoptysis.

DISCHARGES of blood occurring in a remarkable degree, or to any considerable extent, justly excite alarm; particularly when such discharges originate independently of apparent or external cause, or proceed from organs that cannot without much danger be subjected even to temporary derangement or suspension of their functions. The lungs, from construction, situation, and office, are particularly obnoxious to accidents of this nature. Of so much more frequent occurrence after a certain period of life is hæmorrhage from the lungs than any other part, that the general, but improper, expression of a person's having broken *a* blood-vessel, exclusively applies to discharges of blood from these organs*. This discharge in

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* It requires but small acquaintance with the structure and œconomy of the lungs to be sensible that any consider-

in systematic language is termed hæmoptysis; the symptoms, causes, and treatment of which are now to be considered.

When, subsequent to a sense of weight or oppression in the breast, which scarcely amounts to the feeling of pain, together with cough, difficult respiration and general lassitude, a quantity of blood is suddenly, and in a convulsive manner, discharged from the mouth, there can remain but small doubt respecting the part from which it proceeds. If the discharged blood be of a florid colour, and, together with the above symptoms, a saltish taste be perceived in the mouth, and the patient become sensible of a degree of irritation in the upper part of the trachea, the nature of the affection is rendered altogether unequivocal. These, then, constitute the symptoms of hæmoptysis. They continue for some days, or decline almost im-

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considerable discharge of blood from these organs must necessarily be consequent upon rupture of a large *number* of minute vascular ramifications.

mediately

mediately upon their accession, with much irregularity, forming at one time a trivial, at another a very formidable disease. The disorder, however, whatever physiognomy it may assume, should never be totally disregarded. Confirmed consumption, the occurrence of which might by timely care have been obviated, has not unfrequently arisen from this neglect. The danger attendant upon hæmoptysis is not so much indicated by the quantity of blood discharged, nor even by the time to which the affection may be protracted, as by the nature of the patient's constitution, the attendant symptoms, and state of previous and general health. Age and sex have a peculiar influence in modifying the disease in question. Hæmoptysis seldom occurs previously to the period of puberty; nor after this time does it frequently appear in the male—unless excited by some external cause, or in instances where one species of the phthisical temperament is marked by characters of more than ordinary decision.

These characters will be pourtrayed in a subsequent part of the work, and the means pointed out of obviating the tendency which they create to disorganization. We shall in the present instance direct our attention to what are generally termed the exciting rather than the disposing causes of hæmorrhage from the lungs.

SECTION II.

Exciting causes.

It is necessary to premise, in illustration of the manner in which these causes operate in the production of the disease, that the term hæmorrhage necessarily implies debility. This debility may be either partial or general—either produced in a direct or indirect manner. That weakness which occasions rupture in any portion of the vascular system may arise from inordinate force in the circulating power overcoming the tone of vessels in the part particularly injured,

jured, or it may be consequent upon deficient excitement of the general frame directed by accidental circumstances to such part.

Had these simple and incontrovertible principles been retained in the memory, and acted upon by the framers of hypotheses on the pathology of hæmorrhage, many absurd doctrines and unfounded speculations on the nature, and, as it is termed without much precision of language, proximate cause, of these affections would have been prevented. But the simplicity of truth has been disregarded for the pomp of verbose philosophy, and accumulations of error have been the unavoidable consequence*.

An

* In the works of Hoffman a curious specimen occurs of the ludicrous extent to which medical theory, or rather misemployment of words, has been carried in reference to the doctrine of hæmorrhage: not content with employing the indefinite terms of "spasmodic stricture on the internal and external surfaces of the body," this celebrated and unquestionably meritorious

An unproportioned action in the respiratory organs, in whatever manner it may be induced, may, perhaps, properly be regarded as the occasion in every instance of pulmonary hæmorrhage, or that into which every other cause productive of this disorder is capable of being resolved. This undue exercise of the lungs may be called forth by powers applied immediately to these organs, or generated in consequence of corporeal exertion disproportionate to the strength of the body. The cough and spitting of blood, frequently excited in consumptive habits by the violent exercises of walking or running with more than ordinary rapidity, is one of the most frequent examples of the latter. It is by no means unfrequent for blood to

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torious writer introduces his readers to orgasm, ebullition, and turgescence of the blood, arising from increased intestine and expansive motion of its sulphureous aëro-ethereal parts, as diminishing and destroying the systaltic and elastic power of the vessels, and thereby inducing congestion, distension, and rupture."

gush

gush from the nostrils, or to be discharged by cough from the lungs, in consequence of considerable exertion having been employed in these exercises; and the danger attendant upon such exertions is very considerably increased if they are employed to accomplish an ascent. Other causes, however, than the one above cited, have in these instances been supposed powerfully operative towards producing the effect in question. When, in consequence of the important discovery of the gravity of the air, experiments were instituted to ascertain the comparative pressure, in different situations, exerted by the circumambient atmosphere, the tenuity, and consequent levity, of the air was demonstrated, with certain exceptions, to be in the ratio of its distance from the general plane of the earth's surface.

The necessary effect of this variation in atmospheric density, on bodies destitute of animation, is fully displayed by the phænomenon of evaporation, which was the subject of general disquisition in the preceding chapter.

ter. As inanimate bodies, which are in philosophical language in a state of fixidity under the usual pressure of the air, become volatile and dissipated in consequence of the removal of such air, a similar effect has been ascribed to variations in atmospheric density upon the blood circulating through the pulmonary organs; and hæmorrhage from the lungs, upon these principles, is referred to the expansive force of the blood in consequence of "a sudden diminution in the weight of the atmosphere*" overcoming the tonic and retentive power of the vascular organization. That an alteration in the state of the circumambient air is capable of effecting considerable variations both with regard to the feelings and actual condition of the living system, is a fact established upon principles superior to controversy.

Previously, however, to the enunciation of that law by which every form of living existence is rendered in a great measure supe-

* Dr. Cullen's First Lines, vol. ii. p. 379.

rior to powers whose agency is so remarkably displayed on inert matter, every endeavour to explain the circumstance now referred to failed, from obvious causes, of its intended purpose. Were the fluids circulating through every minute part of an animate body affected in a similar manner to mercury contained in the tube of a barometer, existence would not merely be supported by a tenure extremely precarious, but the qualities of life would cease to be displayed. That theory, therefore, is radically erroneous which attributes the occurrence of discharges of blood from the lungs to "a sudden diminution of the weight of the atmosphere" acting either upon the principles of mechanism or chemistry. It is in all instances through the medium of the excitability that external powers operate upon living existence. In the alpine excursions of the celebrated M. de Saussure, the remarkable effects of atmospheric tenuity on the respiratory organs were particularly observed, and have been minutely detailed. Guided by prevailing

theories,

theories, our experimental traveller ascribed the peculiar affections of the breast, and general frame, that occurred during these adventurous journeys of himself and companions, to the induction of a lax and debilitated condition in the vascular system from deficient atmospherical gravity, and consequent diminution of pressure, in the elevated regions to which they ascended. An important difficulty attendant upon this mechanical hypothesis, and which indeed is of sufficient force to prove its invalidity, the following relation of Saussure immediately presents :—" Dès qu'on s'est *reposé*, pendant quelques instans, à ces grandes hauteurs, on sent ses forces entièrement *reparées*; l'impression des fatigues précédentes semble même totalement effacée ; et cependant on voit en peu d'instans tous ceux qui ne sont pas occupés, s'endormir, malgré le vent, le froid, le soleil, et souvent dans des attitudes très incommodes*." The immediate relief

* Vide Saussure, " Voyages dans les Alpes."

from

from fatigue, consequent upon a temporary suspension of exertion, experienced by these voyagers, and the remarkable inclination to sleep that almost invariably occurs in similar situations, are direct evidences that the curious phænomena recorded by this intelligent and interesting narrator were by no means ascribed to their efficient cause.

Suspension of accustomed and appropriate stimuli, rather than diminution of atmospheric pressure, deserves to be regarded as the direct occasion of those peculiar affections of the respiratory organs, and other parts of the system, that are related by Saussure as occurring in different individuals under the circumstances alluded to, with varied degrees of force:—and in every instance of diseased action consequent upon the inhalation of air of more than ordinary tenuity, whether such disorder appear in the form more particularly described in these travels; or whether, as is frequently the case, blood gush from the mouth in consequence of rupture in the pulmonary vessels,

sels,—it is invariably to be referred to a similar source. Tenuity in the atmosphere necessarily supposes a diminished portion of the base of which it is composed, in a given quantity of air, if such quantity be ascertained by measurement. We have already endeavoured to prove that oxygen, or the substance absorbed by the blood in its passage through the lungs, operates by exciting into action the living principle. A subtraction from the ordinary supply of this exciting power must necessarily be productive of weakness, and proportionate incapacity for muscular exertion.—In the lungs this accumulation of irritability from defective stimulation will appear more particularly evident; and in instances of constitutional susceptibility to these complaints, hæmorrhage will almost invariably result from inordinate exertion of voluntary power under the circumstances now described. A demonstration of the principle we are endeavouring to impress as incalculably important, with reference to the pathology of hæmorrhage,

rhage, is furnished by the remarkable fact, that when ascents are effected without the aid of muscular exertion, neither the sensations of lassitude nor diseased affections of any kind are in an equal degree liable to be generated. Persons who have been conveyed by artificial aid to elevated regions in the air, or the summits of lofty mountains, are by no means subject to hæmorrhagic attacks,—because, under these circumstances, the operation of those exciting powers by which alone muscular exertion can be maintained is not in an equal measure required*.

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* This fact was fully illustrated in the late aërial voyages of M. Garnerin. It will be recollected that a disposition to hæmorrhage was experienced by this aëronaut, only when he rapidly and forcibly descended from a certain elevation by means of the instrument denominated parachute.

It may not be unimportant or inapplicable here to state, that an instance of confirmed consumption has presented itself to the author's observation, the origin of

To undue action occasioning debility, and consequent rupture of vessels, are we therefore to ascribe the occurrence of pulmonary hæmorrhage, and not to the mechanical production of laxity from unequal pressure, or the rarefaction and expansion of circulating blood.

Upon these principles we are enabled to account for the similarity in operation of other causes productive of hæmoptysis than that of increased corporeal exertion:—such as the sudden application of heat when the excitability may have been accumulated from previous cold; the excitation of violent passions in subjects of peculiar susceptibility; and an inordinate exercise of the respiratory organs, occasioned by the inhalation of air more than ordinarily irritating; speaking with unaccustomed energy or rapidity; singing; or performing on what are termed wind-in-

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of which was referred to an hæmorrhage from the lungs, occasioned by violent running in order to arrive at the place where this curious descent was made.

struments

struments of music ;—each of which, it may appear superfluous to remark, should be carefully avoided by those who have a constitutional prædisposition to pulmonary disorders.

SECTION III.

Introductory observations on the treatment of pulmonary hæmorrhage.

INDIRECT stimulation may perhaps be regarded as at once the most important and difficult part of medical practice. Of so complicated a structure is the human frame, and so varied are its functions, that, under some circumstances of the system, it becomes absolutely requisite to produce temporary abstraction, for the purpose of ultimately obtaining an increased and permanent quantity of absolute and efficient power.

The treatment required in certain forms of hæmorrhages presents a full illustration of

of the rectitude of this principle. In what are termed active hæmorrhages occasioned by any of the exciting causes above enumerated, it is not merely necessary to withdraw the powers productive of those actions that have occasioned the discharge of blood, but, even while the quantity of strength necessary to the maintenance of health is already diminished, the exigences of the system not unfrequently require a temporary application of sedative remedies,—or, perhaps in more philosophical terms, a further abstraction of stimuli. "An increased disposition to act," without the capacity of effecting a regular and appropriate exhibition of power, is not in every instance to be counteracted by the direct application of exciting agents. An abstraction of blood is frequently requisite, in order to procure immediate relief, and obviate a fatal termination, during the continuance of a certain species of apoplectic paroxysm. In like manner, the employment of the lancet in some cases of urgent hæmorrhagic efforts may be admitted with propriety

propriety and effect. This principle, however, cannot with safety be received without the greatest caution in its application. The indiscriminate practice of having recourse to venæsection in every case of hæmorrhage, founded upon ideas altogether erroneous respecting plethora and mechanical derivation, cannot be too earnestly deprecated; and indeed, where the propriety of sedative applications is indicated,—or, in the language of Dr. Darwin, "a quiescent state of the pulmonary capillaries" is required to be produced,—the employment of other means to effect this purpose, that operate partly upon the same principles with venæsection, is, in the majority of instances, to be preferred.

Authors are accustomed to divide hæmorrhages of every description into the two classes of active and passive. The characteristics of the former are said to consist in fulness and force of arterial action, and general signs of the sthenic diathesis; and in these instances the free use of the lancet is

advised.

advised. Passive hæmorrhage, on the contrary, is described as displaying characters of laxity and general debility in the fibre; and under these circumstances, venæsection is only to be had recourse to with much limitation. This division, however, appears to the author of these pages to be supported rather by conceived analogy than actual fact. A sthenic condition of the system is altogether incompatible with any considerable discharge of the vital fluid, even when such discharge has not originated spontaneously, but has been consequent upon violent and exterior causes. Debility must first be produced before hæmorrhage can be occasioned*.

The further abstraction of blood, therefore, or even the employment of sedative

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* Those causes, which in weak and irritable habits tend to produce hæmoptysis, will occasion sthenic inflammation of the lungs, where the living actions are characterized by vigour and strength of excitement.

applications where the existence of artificial vigour or "suffocated action *" appears to render them necessary, ought in every instance to be prescribed with extreme caution. "Summe cavendum esse censeo a larga et crebra sanguinis detractione, quæ cum morbo conspirabit ad ægrotum exhauriendum†."

The application of cold water to the external surface of the body, suggested by Dr. Darwin, and more recently recommended in the ingenious and valuable publication of Dr. Stock‡, may be regarded as an admirable substitute for venæsection in almost every case of what is generally termed active hæmorrhage. If there be any foundation for the opinion that this fluid is decomposed, and

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* Dr. Stock.

† Heberden, Commentarii, p. 357.

‡ "Medical Collections on the Effects of Cold as a Remedy in certain Diseases." This practice is likewise recommended by Dr. Currie.

that

that its oxygen enters the system, its stimulating agency may be supposed to counteract the injury that might otherwise arise from its primary operation as a sedative. The succeeding stimulant action of this remedy may, perhaps, likewise be in some measure secured in the disorders of which we are treating, as in the instance of fever, by its operating through the medium of the sensations; for active and arterial hæmorrhage is necessarily accompanied by a certain degree of febrile irritation *.

* The operation of cold through the medium of the sensations is a circumstance of extreme importance both in relation to pathology and practice. It is alone by the action of this power on the sentient principle that cold can with propriety be regarded as possessed of an absolute stimulant faculty. This doctrine has been ably illustrated by Dr. Currie. In the course of the present work it will again be considered. It may here be observed, that the agency of other frigorific applications in arresting hæmorrhage may perhaps receive an explanation by attending to this very important but too much neglected law of the animal œconomy.

On

On the operation of emetics as remedies for pulmonary hæmorrhage, and on the digitalis purpurea, the author defers his observations till he comes to treat of the medical history and general management of consumptive affections. He will embrace the present opportunity of introducing a few remarks on the action of those remedies that are termed astringents.

SECTION IV.

Astringents.—In what manner do they operate?

"*Incitatio* densitatis causa fatenda."
Elementa Medicinæ, vol. i. p. 28.

THE term astringent, like that of tonic, applied to powers capable of effecting changes in the living fibre, originated from erroneous assumptions respecting their mode of operation. Certain substances, from the vegetable and mineral kingdom, are capable of corrugating

rugating dead animal matter by exerting a chemical attraction to the fibrous part of which it is composed, and thus effecting a considerable alteration in its mechanical condition, in this manner rendering the material on which they have acted hard or dense. It is by the agency of this power that the process of tanning is conducted; by which process, a comparatively soft and ductile body is rendered firm and rigid in consistence. It is a remarkable circumstance, that several of those substances in which this principle resides, when received into the stomach in extremely small quantities, so powerfully operate on the animated fibre, that they almost immediately restrain hæmorrhagic and other evacuations, that have originated in debility or deficient quantity of appropriate action. This partial coincidence in operation led to a supposition of similarity in power; and the term astringent, by surreptitious authority, or at least from mistaken opinion, has been applied to a distinct class of medicinal substances. It cannot be denied that a peculiarity

rity of action is frequently displayed by these substances, which is incapable of being resolved into the mere quantity of stimulating virtue; and, that an augmentation of general excitement cannot in every instance be made to produce the effects resulting from an appropriate administration of what in compliance with ordinary nomenclature we term astringent powers. This apparent peculiarity of operation appears however to depend rather upon circumstances in the condition of the recipient than in the abstract quality of the agent, which frequently renders the conduct of stimulation so extremely difficult and complicated. The living power is often, in certain diseases, so far reduced as to indicate the propriety of a vigorous employment of the most efficacious stimuli: nevertheless, from certain conditions of the frame, independent on the abstract quantity of excitability, the requisite power cannot in every instance be directly applied. The effects frequently resulting from an imprudent administration of opium may be adduced as an example. Deficient

ficient excitement may have required to be remedied; but the attendant "derangement of the animal movement of actions*" may have opposed itself to the admission of the requisite degree of stimulation to the restoration of health. We may, therefore, conceive, the condition of the fibre, during the existence of those diseased actions that occasion hæmorrhagic and other inordinate discharges, to be such as to require a certain *kind* of stimulus; and that this requisition is supplied by astringent remedies as far as their operation may be successful in the production of the desired effect.

There is, however, another principle in the action of medicinal powers, to the admission of which our assent cannot be refused, although it materially affect the beautiful simplicity of the Brunonian doctrine, and the abstract application of the postulata of its cele-

* Dr. Jackson. Vide Remarks on the Constitution of the Medical Department of the Army. 8vo. London. 1803.

brated

brated author to medical practice. The exciting power of certain agents is directed with peculiar force to certain parts. Thus, for example, the absorbent system of vessels shall be stimulated into vigorous action by powers that by no means exert an equivalent force throughout the universal frame. If some substances, in which the astringent quality is generally imagined to reside in a peculiar degree, be merely applied to the tongue, an immediate roughness and sense of dryness will be produced. Such feeling, and actual condition of this organ, is consequent upon the excitation of its absorbents in a superior degree to that of the other parts of its organization*: but, while the stimulant operation of

* In the materia medica of Dr. Darwin, the articles which are generally arranged in the class of astringents are referred by this author principally to the "sorbentia." The effects, however, of these powers cannot be solely attributed to their agency upon the absorbent system. Vide Murray's Materia Medica, article "Astringent."

such

such substances is acknowledged to be partial, it is to be recollected, that the apparent corrugation which they produce is altogether different from a supposed similar effect operated upon matter deprived of vitality.—This is a fact sufficiently evident, but receives still further confirmation by the circumstance, that a comparatively minute portion of materials containing the astringent principle, when taken into the stomach, frequently produces this imaginary effect of mechanical or chemical corrugation, by almost immediately restraining inordinate discharges made from a distant part—thus being propagated by a law of animate existence, or diffused by the medium of excitability through the general frame, displaying its maximum of power where its operation is more particularly required. "Nothing is of itself" (says a celebrated physiologist of the chemical school) "either stimulating or sedative; but the action entirely depends on the state of the organs with which it enters

into

into combination *." The doctrine, however, which this author labours to establish, may, perhaps, be regarded as sufficiently refuted by the different manner alone in which the powers that are now the subject of disquisition display their agency on living existence and mere inanimate matter. It may, however, further be urged, as an argument against the chemical principle of medicinal operation, that two substances of a different and even opposite nature frequently exert a similarity of power on the human frame, when administered as remedies in various forms of disease; but, perhaps, the most decisive and triumphant evidence in favour of the doctrine of direct stimulation, is furnished by the remarkable agency of the mental faculties and affections upon the feelings and actions of the

* Fred. Alex. Von Humboldt, "Experiments on stimulated muscular and nervous Fibres, with Conjectures on the chemical Process of animal and vegetable Life." Vide Annals of Medicine by Dr. Duncan, An. 1799, p. 211.

 corporeal

corporeal frame. The records of medicine supply ample testimonies of this important and instructive fact. Profuse discharges, and various other disorders that have resisted the operation of mere physical stimuli, and menaced the extinction of vital power, have been known immediately to yield to mental excitation, which, it is presumed, few will be disposed to maintain operates primarily by virtue of chemical union.

If, then, certain medicinal substances, which have not the smallest power to corrugate the fibres of dead animal matter, may be made to exert an astringent faculty by an appropriate administration; if, comparatively, a minute portion of certain materials, that operate as constringent powers upon some forms of exanimate existence, by reception into the stomach of a living animal exert their astrictive influence immediately, and upon a distant part of the frame; if an impulse purely mental frequently occasion so important an alteration in the bodily system, as to arrest, with a rapidity and power almost inconceivable, the

progress

progress of the most malignant disorders—facts that are altogether indisputable—it necessarily must be admitted, that stimulating agency and the vital principle are exerted and maintained by a separate and independent power. "In *vivum* corpus agunt medicamenta."

SECTION V.

Particular treatment of hæmoptysis.

The subject of pulmonary hæmorrhage will be resumed in a subsequent part of the work. It may not however be improper, previously to its present dismissal, to introduce one or two further observations in relation to the particular treatment required in this affection.

From what has already been remarked respecting the circumstances of the general frame and organs more particularly affected in hæmoptysis, it will readily occur to the student and incipient practitioner of medicine, that the principal difficulty in combating this affection

affection arises from the simultaneous existence of circumstances which demand and oppose the administration of invigorating agents. Inordinate action is to be restrained, while an increase of stimulus is to be imparted.

The materia medica furnishes the practitioner with a class of medicinal agents, which, on account of their peculiar operations on the system, have with some propriety obtained the denomination of restringents. Restringents are substances which exert a more moderate degree of astrictive agency than those powers which in the preceding section were more immediately the subjects of disquisition, and which repress inordinate and irritative action, at the same time that they augment the force, and secure the permanence, of requisite and regular excitement.

Restringent medicines are furnished from the vegetable and mineral kingdoms. Those of the latter class are unquestionably the most efficacious; and of these the mineral acids, particularly the vitriolic, are generally to be preferred.

preferred. Of the power and utility of this last medicine the author's practice has afforded him decided and repeated evidences. This acid has the peculiar advantage of being admissible, by an appropriate regulation of its dose and forms of administration, in almost every modification of pulmonary hæmorrhage, whether the irritative actions of the arterial system are morbidly increased, or more sensibly diminished. Vitriolic, or, as it is termed in the modern nomenclature, sulphuric acid, has been variously denominated, according to its apparent operations upon the frame, an astringent, tonic, stimulant, and refrigerant.

These apparently contradictory operations are entirely dependent upon the accidental expressions of different diseases in which they may be administered, whose essential characteristics, and prime source, are a debilitated fibre; such debility, with its various consequences, being counteracted and subdued by the peculiar stimulant agency of the medicine in question. A combination of this acid with a certain earth, forming the salt which is universally known under the denomination

tion of alum, has likewise been greatly celebrated as a powerful restrainer of hæmorrhagic discharges. In hæmoptysis, however, particularly in that form of the complaint which systematics term hæmoptysis phthisica, its utility is decidedly less evident, and the propriety of its administration frequently otherwise more questionable than that of the mineral acids.

Opium is frequently necessary in hæmoptysis. In the administration of this, and every other restringent remedy, much attention is often required to insure its full and uninterrupted operation, by preserving a regularity in the alvine discharges. Irritating cathartic medicines are, however, in every case of phthisical hæmoptysis, with the exception afterwards to be pointed out, to be carefully avoided. All other sources of inordinate irritation are necessarily, upon similar principles, to be as much as possible guarded against, and a particular attention is required to the subduction of what may have been the more obvious and particular cause of the disordered actions.

CHAPTER VII.

Catarrh.—Obvious and more particular connection of this disease with phthisis pulmonalis.—Symptoms.—Causes.—General treatment.

There are various opinions respecting the origin of that disposition to pulmonary consumption so peculiarly observable in the British islands. This peculiarity, by some authors, is referred to the great prevalence in this country of scrophulous affections; by others it is attributed, perhaps with greater propriety, to the extremely disproportionate frequency of those disordered states of certain organs and of the general system, that are in a vague manner indicated by the improper denomination of a *cold*.

From the frequency, indeed, of catarrhal affections as præcursors of genuine and confirmed phthisis, an intimate relationship has been established by universal consent between colds,

colds, coughs, and consumptions. It is unnecessary, therefore, to remark, that in a treatise devoted principally to the consideration of the last-mentioned species of disease, the subject of catarrhal complaints, as introductory to the more regular history of consumption, requires particular attention.

SECTION I.

Symptoms and general characters of catarrh.

The principal characteristic of catarrhal disorders is included in their generic appellation; which, however, cannot with strict propriety be regarded as merely a scientific term to express that condition of the system commonly indicated by the expression—a cold. Catarrh properly signifies a defluxion, or increased excretion from the secretory, or, as it is generally termed, mucous membrane, that lines the internal surface of the nose, fauces, and bronchia.

With this augmented secretion, the result of

of increased and inflammatory action, a degree of general irritation is invariably present, such as increased frequency of pulse, thirst, hurried or otherwise disordered respiration; and if the inflammation be considerable, and extended through a large portion of the bronchial cavities, a cough is excited, and an expectoration of the secreted mucus. It is thus rendered evident, that a cold, if the term be applied to denote inflammatory defluxion from that portion of the vascular and very irritable membrane which is not merely confined to the nostrils, fauces, and trachea, but is extended through the whole internal surface of the lungs, has not merely an intimate connection with an actual inflammation of these organs, but is in reality the same disease, differing alone in degree. This identity of catarrhal and pulmonary inflammation it is important to recollect. Nothing perhaps is more injurious to medical science than an exuberant multiplicity of nosological distinctions, which, in reality,

serve no other purpose than to mislead and betray. By regarding that membrane which lines the internal surface of the nostrils, is extended through the bronchia, and at length forms those numerous air-vesicles of the lungs that have already been described, as one continued, very vascular, and irritable covering to this large expansion of surface, comprehension will be materially assisted in tracing the intimate connection of the respective disorders of these organs, that have been erroneously imagined to possess a specific variety in character; and the gradations from slight or incipient catarrh to genuine and confirmed consumption, will thus present themselves to view, unobscured by the clouds of artificial discrimination.

On the manner in which these disorders tend to produce phthisis, we shall afterwards offer some general remarks. We are now to inquire into the exciting causes of catarrh.

SECTION II.

Exciting causes.

THE important revolution effected in the science of animate nature, is rendered particularly evident, by the great acquisition made to our knowledge respecting the operations of cold and heat on the living system. The labour of research into this department of inquiry had been hitherto merely rewarded by the painful consciousness of defective information. Concealed and oppressed by an erroneous theory, the full development and entire expansion of truth was long and lamentably prevented, till at length, by daring exertion, her freedom from restraint was effected, and she was made to assume her genuine character.

In the earlier periods of science the mere sensations of heat and cold were, with the utmost impropriety, regarded as indices of the abstract nature and quantity of these powers. The great and important discove-

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ries of modern times respecting the laws regulating the temperature of animate and inanimate bodies, materially assisted the physiologist in unfolding several circumstances of the animal œconomy that were previously complicated and obscure.

Still, however, the peculiar laws of life were unknown and neglected as a guide to physiological research. Of the truth of this remark abundant evidence is afforded in the theories which were proposed to explain the operation of cold, as productive of catarrhal and other pulmonary disorders.

Obstructed perspiration was long a favourite dogma of the schools. In consequence of the observed or supposed diminution in cutaneous discharge, occasioned by an application of cold to the surface of the body, and the connected or subsequent augmentation of excretion from other organs, as in the particular example before us, the membrane of the nostrils; the latter was judged the effect of the former, upon the same principles that an increased flow of fluid from one

part of an hydraulic machine is effected by the obstruction of a distant but connected portion of its structure. Thus the celebrated Sydenham, whose merits have entitled him to the appellation of the English Hippocrates, offers the following explanation, which was regarded in his time as altogether self-evident and incontrovertible, of the effects occasioned by an obstruction of the cutaneous perspiration:—"Animadvertendum est, effluvia ista, quæ a sanguinis massâ per insensilem transpirationem obligari solent, a frigore cutis spiracula subito contrahente introverti, et in pulmones deponi, quos irritando tussim mox excitant*." Even were we to acknowledge the justice of this explanation, it evidently accounts for only one, and that an accidental, or by no means an invariable symptom of the disorder supposed to be occasioned by the direct application of cold to the surface of the body. This supposed vicarious discharge

* Sydenham. Tuss. Epid. p. 207.

does not, however, invariably occur. Every symptom of a cold shall frequently be present, without this peculiar affection of the mucous membrane in any part of its surface; and in other instances, from direct irritation induced in this vascular and very excitable part, the catarrhal discharge shall be occasioned independently of any diminution in the quantity of cutaneous or other excretions. This latter circumstance is particularly deserving of remark. It entirely overthrows the doctrine of mechanical derivation. By an increased *action* in a particular organ, an augmented secretion of such organ is proved to be generated without the smallest subduction of any other fluid to afford its supply. Certain irritating substances introduced into the nostrils shall, under circumstances of peculiar irritability in their investing membrane, be productive of a genuine catarrh, or, at least, of what has been regarded as the prime and essential symptom of a *cold*, and as the necessary consequence of obstructed perspiration, without either the previous application of

of cold, or the smallest interruption in the cutaneous discharge.

An observation of several of the laws by which animal secretion is regulated had already produced a considerable modification of the above-mentioned theory: the connection, however, between the external application of cold and the catarrhal excretion, remained mysterious and inexplicable; and no just theory was afforded of the precise manner in which a *cold* is produced, previously to the introduction of the principles of Brown, and their application to the subject at present under remark*.

Cold was properly regarded by our author merely as the negation of heat. It necessarily follows from this undeniable position, that what by medical systematics had been universally considered as a power possessed

* The theoretical speculations of Dr. Cullen on the agency of cold, while they display considerable ingenuity, are extremely unsatisfactory and obscure. The principal cause of this obscurity is now rendered sufficiently obvious.

of

of abstract qualities, is in no measure operative in a direct and independent manner, but that its apparent effects on the system are altogether referrible to the succeeding action of heat*. "Frigus nunquam nocet, nisi ubi ejus actionem calor excipit †." By the enunciation of this single law respecting the mutual operation of cold and heat, which is entirely confined to the living system, the whole mystery was at length unravelled; and the production of those deranged sensations and actions that constitute the disorder denominated a cold, from an erroneous theory of its origin, were satisfactorily proved to be entirely dependent on the subsequent application of heat or other stimuli.

A cold then, or a catarrh, both of which de-

* The development of the laws governing animate existence, as it respects the sensations, has considerably qualified, but does not in any measure oppose, the fundamental principle of this important doctrine, or rather expression of an undeniable fact.

† Elementa Medicinæ, vol. ii. p. 42.

nominations

nominations are equally inaccurate, is to be regarded as a general irritation induced throughout the whole system, by inordinate stimulation; and the application of cold, which may have preceded the generation of this irregularity in action, is not, as was universally conjectured, the immediate cause of such irregularity, but merely operates by increasing the disposition to be affected by exciting agents. Were we then to continue the principle of nomenclature that has regulated the denomination of disease in the present instance, by placing the supposed cause for the effect, it evidently appears, that the term *heat* would be employed with greater accuracy than that of *cold*, to denote the existence of this particular form of deranged action. The extraneous application of heat, beyond the ordinary measure of supply, is, however, by no means a necessary, although a frequent cause of catarrh. The abstraction of stimuli attendant upon a previous application of cold, by rendering the system more than ordinarily excitable, indirectly produces a similar effect

effect with that consequent upon an absolute and exterior increase of exciting power. This circumstance it is important to recollect. It affords a satisfactory reply to several objections that have been urged against the validity of the above theory of catarrh; and, while it modifies the important axiom of Brown in its particular application, does not in any measure interfere with the fundamental principle on which such axiom is immovably established. If, after an improper exposure of any part of the body's surface to cold or damp, a person suddenly approach a large fire, the symptoms of a cold will for the most part be speedily generated. Such symptoms, however, shall frequently occur, although not with equal force or rapidity, by mere exposure to cold, without the subsequent application of increased and artificial heat. A temporary catarrh, for example, that is, an increased secretion from the mucous membrane of the nostrils and fauces, may be almost immediately generated by exposing the naked arm to the contact of cold air,

while

while the other parts of the body are defended by clothing; and this effect will be found to occur with a celerity and force commensurate to the heat to which the body may at the time be subjected, or to the degree of cold thus partially applied. Dr. Darwin explains this circumstance by supposing a "reverse sympathy" of the organs affected, with the surface of the body; the increased action of the former being consequent, by virtue of this sympathetic connection, upon the diminished action of the latter. This explanation, however, is no other than a mere statement of the fact in philosophical terms; and reference must again be made to the original position of Brown, for an appropriate interpretation of the present subject of inquiry.

When any particular portion of the body, as in the present instance, is suddenly deprived of the stimulant power which was previously operating, a proportionate accumulation of excitability is the consequence. This accumulation of excitability, as the expression indeed fully indicates, renders the body

body sensible in a superior degree to the influence of stimulating agency, and an increase of general irritation is the necessary result. The mucous membrane of the nostrils is, in this and in other instances of the production of catarrh, subjected to a particular degree of irritation, partly from its great vascularity, and partly in consequence of acquired habit from frequent exposure to direct sources of irritation.

That inflammatory action, then, which augments the secretion from the mucous membrane of the nose, fauces, and bronchiæ, and which, when violent, frequently extends itself through the whole internal surface of the pulmonary organs, is to be regarded as the consequence of inordinate excitation, either induced by direct application of irritating causes, or generated in consequence of heat or other stimuli, external or internal, operating upon the whole frame, and displaying its influence in particular on this extremely vascular and susceptible part of our organization.

On

On the importance of acquiring accurate ideas respecting the generation of catarrhal affections, and on the relation of the human system to the powers of heat and cold, the author will more particularly treat in a subsequent part of the work, when engaged in an inquiry into the preventives of pulmonary consumption.

SECTION III.

Treatment of catarrh.

It necessarily follows from the principles which in the preceding section the author has endeavoured to illustrate, that the popular mode of treating catarrh is not only erroneous, but in many instances attended with extreme danger.

If, from a mistaken idea of the origin of those anomalous symptoms which are characterized by the appellation of a cold, and of which the irritation excited in the mucous membrane of the pulmonary organs is frequently

quently the most prominent, the method usually had recourse to for the purpose of counteracting such symptoms be employed, the extreme danger to which the lungs are exposed, even by the process of cure, may easily be imagined. "Catarrhum igitur calore solvendum gravissimus error est *."

Even the temporary success attendant upon the stimulant plan of treatment in colds and inflammatory coughs by no means justifies its adoption. A fire burning with too great rapidity would be eventually moderated by a temporary augmentation of its force and brilliancy. No one, however, to extinguish a flame, increases its energy. Such conduct would be equally proper with that of "feeding a cold" for the purpose of more speedily counteracting the symptoms of the disorder. This erroneous principle nevertheless has been generally pursued, and frequently attended with irrecoverable detriment. As, however,

* Brunonis Elem. Medicinæ, loc. supra cit.

in

in the instance of hæmoptysis, and indeed in every other disorder to which the complicated structure of the human frame is momentarily subject, great care is requisite in the application of abstract principles; so, in the present instance, the axiom of Brown, that "the simple application of cold is sufficient for the cure of catarrh," requires considerable limitation.

The author has already endeavoured to explain the indirect manner in which cold, independently of the subsequent stimulus of extraneous heat, is productive of inflammation in the mucous membrane of the lungs, and of general derangement throughout the whole frame. It is an important circumstance attending catarrhal irritation, that natural sensibility to cold is, for the most part, increased during the continuance of the disorder. This peculiarity will again be referred to in a more particular manner. Here it is only necessary to observe, that an exposure to cold, particularly if the application be partial, and attended with unpleasant sensations,

tions, does not operate by directly abstracting from excitement, and thus diminishing the violence of the derangement, but often augments its force and increases its permanence, entirely upon similar principles with those which regulated its primary production.—This circumstance, the author conceives, has not received sufficient attention either from the disciples or opponents of the Brunonian doctrine. To the cause of the disease, rather than to the peculiarities by which it is characterized, has the treatment in either case perhaps been too indiscriminately directed. Equal and similar injury may result from the improper abstraction and inordinate admission of exciting agents.

While, therefore, the common routine of practice in the treatment of colds is earnestly deprecated, as founded upon principles entirely erroneous, and attended with danger in proportion to constitutional susceptibility to more formidable disorders of the pulmonary organs, an equal danger, on the other hand, we must recollect, is to be apprehended, from

a mis-

a mistaken application of ſundamental and important truths.

The dictates of nature form, for the most part, the safest directory for the conduct of the physician; and where extremes of temperature are particularly obnoxious to the feelings, which is remarkably the case in catarrhal affections, instinct alone establishes their impropriety.

An inflammatory catarrh will be most safely and effectually counteracted by avoiding as much as possible every *irregularity* in the action of exciting powers, and particularly by preventing *sudden* or *partial* exposures to cold or heat. Excitement will in this manner be exhausted by its own action, and health will succeed to derangement.

CHAPTER VIII.

Pneumonia, or inflammation of the lungs.—Its similarity with catarrh.—Improper distinctions of systematic authors.—Symptoms.—Causes.—Cure.

IN the preceding chapter it was observed that catarrh and inflammation of the lungs differ merely in degree; and both the theoretical and practical advantages arising from regarding this similarity in various disorders, which the refinements of nosology have considerably obscured, were represented as particularly applicable in relation to the pathology of consumptive complaints.

It may therefore excite surprise, that the author should devote a separate chapter to the consideration of pneumonia as a disorder præcursory of consumption. To this distinction he has been directed principally from a consideration of the dissimilar manner in which

which the foundation is laid of genuine phthisis by the different degrees of pulmonary inflammation; and, indeed, however erroneous may be the principles upon which scientific nomenclature is established, considerable innovations are invariably to be regarded as involving the hazard of experiment.

SECTION I.

Symptoms.—General remarks.

The symptoms indicating a violent inflammation of the lungs and their connecting membranes, are a great increase of general irritation, with a proportionate augmentation in the number and force of arterial pulsations; respiration extremely difficult; acute pain in the thorax, which, according to the situation and extent of the disorder, shall be confined to one, or extended over to the opposite side, such pain being rendered more pungent by every inspiration; painful, and, in

in the earlier periods of the disorder, dry cough, which will be afterwards attended with expectoration, and in some instances the matter ejected shall be tinged by a mixture of blood. It should likewise be observed, that during the existence of the inflammation in this active form, which may be several days, the pain frequently changes its seat from one to another part of the thorax.

The above symptoms, when existing in conjunction, are necessarily characteristic of a violent disorder. They properly constitute the pleuritis (pleurisy) of authors; and the distinction between this form of inflammation and that in which the symptoms are less urgent has been principally, but erroneously, established upon an imaginary difference in the seat of the disease. Thus, that inflammation induced by a catarrhal complaint of more than ordinary violence and extent, or occasioned in consequence of an inferior degree of action in the exciting powers, has been generally termed peripneumony, or an inflammation of the substance of the lungs; while

while the denomination of pleurisy has been given to the more urgent disorder, from a supposition of the inflammatory action in this latter instance being confined, or peculiarly directed, to that strong membrane which has already been described as investing each portion of these organs.

When, indeed, the disorder is consequent upon an inflammatory action commencing in the fauces or nostrils, and extended through the whole length of the mucous membrane, in the manner delineated in the preceding chapter, the irritation is frequently confined to this membrane, or at furthest diffused into what is termed the parenchymatous substance of the lungs, and the inflammation may terminate without being conveyed to their external covering (the pleura); while in other instances this latter membrane may be that primarily inflamed, and, if an early resolution of the disease be obtained, the internal or mucous membrane may not have participated in the deranged actions. But, whatever may be the primary seat of pulmonic inflammation,

tion, in consequence of their vascular continuity, neither the membranous nor parenchymatous substance of these organs can, for any considerable period, be the subjects of exclusive or independent affection.

That kind, or rather degree, of pulmonic inflammation, the symptoms of which have been just enumerated, occurs principally in those constitutions that are characterized by vigour, and at that period of life in which the actions of the system have arrived at their *acme* of force. It is a disease of the sthenic diathesis.

The peculiar liability of the constitution to inflammation of the pleura, over that of other membranous parts, has been attributed, by an anatomist of considerable celebrity, to the free communication of the vessels which are distributed over the pleura "with the external vessels on the sides of the chest," these latter, from their situation and office, being peculiarly exposed to an inordinate degree of irritative action; and likewise to "the greater consent between the action of the external and internal

internal vessels of the chest than in the body generally*." The intimate connection, however, of this membrane with those organs that are constantly exposed to the immediate as well as indirect sources of great excitation, is obviously the principal cause of the disproportionate frequency of pleuritic inflammation to that of any other membrane lining cavities which have no external opening.

SECTION II.

Exciting causes.

The connection which the author has endeavoured to establish between all forms of pulmonary inflammation, whatever complexional character they may at different times assume, is rendered particularly obvious by the similarity in their exciting causes.

In consequence of improper exertion of

* Vide Baillie's Morbid Anatomy, p. 34.

muscular

muscular energy, inhalation of air too stimulating in quality, excitation of violent passions, or improper exposure to cold or heat,—a rupture of blood-vessels and consequent hæmorrhage from the lungs, a species of temporary catarrh, or an inflammatory affection of part of the mucous membrane, or a more violent irritation in these organs and their surrounding membranes, according to constitutional susceptibility, shall be respectively occasioned.

In the majority of instances, however, the occurrence of any of these disorders, particularly of the last, may be traced to an imprudent exposure to cold, which invariably operates in the indirect manner described in the preceding chapter.

Besides the sources of irritation above enumerated, the lungs, in consequence of their peculiar susceptibility, are rendered obnoxious to other exciting causes which have not hitherto been the subjects of remark, but which, in reference to phthisical disorganization, have claims to particular consideration.

Every

Every eruptive disorder of the sthenic class invariably excites a considerable irritation throughout the universal frame. While the morbid excitement characteristic of these affections is displayed with peculiar energy on the external surface of the body, other parts, in proportion to their vascularity and general irritability, are frequently excited into a particular degree of inordinate action. The measles, small-pox, and erysipelatous eruptions, but in a particular manner the former, abundantly exemplify this remark. The measles are seldom observed to affect the habit with any considerable degree of violence, without the occurrence of a proportionate degree of pulmonic irritation. The cough and other catarrhal symptoms denoting an inflammation of the mucous membrane frequently precede the cutaneous eruptions, and are protracted beyond the season of their decline, forming, both in respect to present symptoms, and more particularly in relation to future periods, the most important appendant of the disorder. Inflammation occasioned

 in

in the lungs by exanthematic irritation, frequently constitutes the foundation of confirmed and irremediable phthisis. This circumstance deserves far greater attention than it has hitherto received. Its importance, however, has lately been impressed with the utmost propriety on the public mind by an author of great ingenuity and extensive experience. Whatever quaintness may appear in the following observation, the maxim which it inculcates cannot be too highly appreciated, or too earnestly enforced. "If your convalescent from small-pox, hooping-cough, scarlet fever, or measles, bark but once, fear lest there be a murderer within; and, though dislodged, expect him again, he now knows the way*."

By an attentive inquiry into the commencement and gradual progress of pulmonary disorganization, the author of these pages has frequently traced the origin of ge-

* Hygëia, Essay 7th, p. 95.

nuine consumption to one or other of the above-mentioned eruptive disorders neglected or ill-treated; and the feelings of humanity are never perhaps more painfully exercised, than in the melancholy contemplation of victims to those calamities, which have originated not from "the unalterable constitutions of nature," but are the unquestionable results of improvident conduct or erroneous practice! "For want of timely care, millions have died of medicable wounds*."

SECTION III.

General treatment of pneumonia, and correction of particular symptoms.

An appropriate arrangement of materials is perhaps one of the principal difficulties which attend the composition of a medical work. The remarks that were introduced respecting

* Armstrong.

the treatment of catarrh ought, perhaps, in strict propriety, to have been considerably enlarged, and extended to the more particular symptoms which frequently occur in this disorder. The author, however, to avoid as much as possible unnecessary repetition, has transferred such observations to the present section, into which they have an equal claim to be admitted.

The identity of catarrh, and inflammation of the lungs, is rendered still further evident by the phænomena that were in the preceding section alleged to be frequently the principal and most important circumstances attending certain forms of eruptive disorders, particularly the measles. Inflammation of the pulmonary organs in every degree and variety, from apparently the most trivial irritation of their internal mucous membrane, displayed by sneezing, slight cough, and other symptoms of incipient disorder, to the most decided forms of pneumonia, in which the deranged actions have extended through the substance of the lungs and arrived at their investing

investing membranes, is equally the result of the more ordinary causes of *a cold* and of exanthematic irritation, and demands the same general method of treatment—a regimen formed of materials irritating in the smallest possible degree, and a careful preservation of equality in external temperature; such course being in every instance "accommodated to the degrees of *action* in the system," and to the sensations of the patient, to an almost total disregard of the accidental circumstances from which the disorder may have originated, and particularly of the unfounded theory of acrimony as a specific and direct source of peculiar disease. The necessary modification of these principles will be noticed in another place. We are now to treat in a more particular manner of their application to the disorder under remark.

The more violent forms of inflammation of the lungs, the symptoms of which have already been enumerated, strenuously call for decided treatment. A fatal termination is frequently a speedy consequence of neglected

 pneumonia:

pneumonia: and in other instances the disorder rapidly degenerates into confirmed and irrecoverable phthisis. Venæsection is here admissible, and frequently required to a large extent. By producing copious evacuations of blood, the violence of excitement is diminished with great celerity. In these instances, direct and permanent abstraction of suprefluous or inordinate power is effected by the free employment of the lancet. It is only, however, during the earlier stages of the complaint that venæsection can be had recourse to with propriety or safety. High excitement is shortly succeeded by corresponding depression; and to withdraw blood after the inflammation has subsided is dangerous in the extreme. By the urgency of the symptoms, and not by the abstract period of their continuance, must the conduct of the practitioner necessarily be directed: it may, however, be stated as a general rule, that venæsection is seldom admissible, in the most violent forms of pulmonic inflammation, after the third or fourth day of the disorder.

When

When the excitement has been in some degree moderated, although the inflammatory disposition remain, an application of blisters "on the surface of the chest will be attended with important benefit. Their stimulant power appears to obviate the rapid occurrence of indirect debility, and the evacuation which they produce considerably modifies and regulates the excitement otherwise attendant upon their operation. During this plan of treatment, that irritation which would be occasioned from a retention of the alvine excretions must be obviated by refrigerating evacuants, but stimulant cathartics are carefully to be avoided.

Such is the plan of treatment which the author has been accustomed to adopt in diseases of violent general excitement accompanied with local inflammation of the pulmonary organs—diseases comparatively of infrequent occurrence. A remedy, however, has recently been introduced, the powerful and extraordinary operation of which has in a great measure effected a revolution in medical

cal practice, as far as it relates to the counteraction of inflammatory disorders, particularly when connected with a disposition to lymphatic complaints. On the peculiar manner in which the digitalis purpurea displays its remarkable agency in reducing inordinate excitement, the author defers his observations till a future period. It may be sufficient in this place to remark, although this important and active remedy has by no means confirmed the ardent expectations entertained of its virtues by its more sanguine and enthusiastic admirers, that the promises of its efficacy have been realized to such an extent as fully to justify the following eulogium: "This medicine may almost be said to be possessed of a charm for allaying inordinate action of the heart and arteries; and in this point of view, as well as for its efficacy in some kinds of dropsy, particularly hydrothorax, its introduction into medicine is one of the greatest benefits our science has received in modern times*."

It

* Dr. Currie's Medical Report, vol. ii. p. 419.—It is not

It has already been observed, that the speedy occurrence of indirect debility, or of corresponding depression, to inordinate excitement, is a necessary consequence of high and active inflammation. The principal difficulty attendant upon the treatment of these affections, particularly where the local excitation was directed to the pulmonary organs, when conducted upon the plan above described, that of depletion and direct abstraction of power, consisted in ascertaining the degree of stimulus necessary to be withdrawn: an extravagant evacuation of the vital fluid, even in instances where considerable expenditure

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not the least important advantage attendant upon the employment of digitalis in inflammatory complaints, particularly of the chest, that its continuance and gradual increase are admissible when extensive effusions have taken place, and even when suppuration to a considerable extent has succeeded to the symptoms of inflammation. In these cases the powers of life are to be suported by tonics, while the foxglove is administered in large doses to excite the absorbent vessels.

had

had appeared to be admissible, has too often occasioned a sudden, unexpected, and irrecoverable exhaustion of constitutional energy. Hence the frequent occurrence of hydrothorax succeeding to violent pneumonia. Venæsection, even when necessary, can never be regarded in any other light than as a *necesary evil.* If exhaustion of excitement can be obtained without the direct abstraction of that fluid, a due quantity of which is absolutely necessary to preserve the existence of the vital principle, the method by which such reduction is procured must unquestionably possess a decided superiority. Digitalis, in a very considerable degree, supplies this important requisition. In the more violent forms of sthenic inflammation, many instances of which presented themselves during the preceding spring months, in which the rapid successions of extremes in temperature, so remarkably characteristic of this climate, were particularly prevalent, the important agency of this remedy was frequently and forcibly illustrated; and the repetition of the first venæsection,

næsection, which was generally had recourse to in order to prevent immediate disorganization when the inflammatory symptoms were extremely urgent, was seldom required. Dr. Currie very properly remarks, that "digitalis may be used with safety and success in cases where the lancet can no longer be employed:" and he adds, "I have employed this remedy to a very considerable extent in inflammation of the brain, of the heart, and of the lungs; and have succeeded with it in situations where I should otherwise have despaired*."

If, however, the importance of a medicinal agent may be calculated from the extensiveness of its application, it is in other degrees of pulmonic inflammation than that more particularly alluded to in the preceding remarks, that the employment of digitalis deserves to be regarded as so eminent an improvement in medical practice. To these

* Medical Reports, loc. sup. cit.

last, therefore, the reader's attention is more particularly required: and this part of our subject affords an opportunity for again illustrating the importance of recollecting the virtual identity of catarrhal irritation, from whatever source it may have originated.

Among the exciting causes of inflammatory affection of the lungs, it will be recollected, that the derangement of the general frame during the existence of certain eruptive diseases was said to occasion, under different circumstances, every degree of irritative action in these organs; and frequently to lay the foundation for confirmed phthisis. Digitalis, by careful and appropriate administration, if due attention be at the same time given to the regulation of diet and temperature, will, for the most part, effectually obviate the consumptive tendency generated by the continuance of such inordinate irritation.

These eruptive disorders more generally occur in the peculiarly irritable habits of children, in whom excitability can, for the most part,

part, be moderated with extreme facility by a judicious employment of this powerful drug.

The cough, which is frequently violent, and protracted beyond the period at which the eruptive excitement abates, may generally be subdued by foxglove, in doses apportioned to the age of the patient and to the degree of prevailing irritation. The more ordinary method of abating cough in general, from whatever source it may proceed, is by the administration of balsamic and oily medicines, which are supposed to sheath from acrimony, and mechanically or chemically to obtund the inordinate sensibility. It scarcely requires to be observed, that this principle can operate at furthest but very partially; and even when the administration of oily emulsions is not objectionable, or when cough proceeds from direct disorder in the mucous membrane of the lungs, the application of such substances is made to comparatively a small portion of the surface affected. Every form of cough, whether pulmonary or sympathetic, is most speedily and effectually subdued

dued by remedies which operate immediately upon the moving fibre. In the irritative coughs, to which we are at present more particularly referring, digitalis, by speedily removing its cause, will thus radically obviate the effect; and, in the majority of instances, will supersede the necessity of auxiliary combinations, which are intended to counteract every particular and accidental symptom. Simplicity of prescription cannot be too urgently recommended. That motley mixture of medicinal articles which characterizes the recipes of some physicians, approaches, both in appearance and reality, to the absurdities of mere empirical practice. Nothing, perhaps, furnishes a more decided demonstration of the great improvement in modern medicine, than the diminished complication of medical prescription. To the cause, and not merely to the symptoms of disease, attention is principally to be directed, and remedies, in the majority of cases, almost exclusively to be applied.

CHAPTER IX.

Tubercles—their nature and origin—not necessarily scrophulous.—Different modes in which phthisical disorganization is occasioned.

ALTHOUGH a general similarity obtains among the respective individuals which compose the vast mass of society, in relation to those powers by the agency of which life is generated, supported, and at length consumed, it cannot be denied, that in different instances there is a certain degree of peculiarity with regard to constitutional susceptibility and character. On these individual peculiarities, as far as they are connected with the subject of consumption, the author purposes to introduce some further remarks in a subsequent part of the work. It is here, however, proper to premise, that phthisical disorganization of the lungs has been thought an exclusive attendant on the scrophulous temperament. Morbid dissection has been supposed

supposed to corroborate this opinion; as in the majority of lungs that have been subjected to examination, where death has been consequent upon this disorder, the substance of these organs has been found loaded with numerous bodies of a roundish figure and firm consistence, that have been generally denominated *tubercles*, and were formerly imagined to be indurated glands. A greater accuracy in anatomical research has proved this opinion with respect to their structure to be erroneous. "There is no glandular structure in the cellular connecting membrane of the lungs; and on the inside of the branches of the trachea, where there are follicles, tubercles have never been seen *." These bodies are, at their first formation, of very inconsiderable size. They, however, gradually increase in magnitude; and their more ordinary bulk is that of a garden pea, or horse-bean. When tubercles are opened,

* Baillie's Morbid Anatomy, p. 46.

their

their general structure appears to be cartilaginous, and a grumous matter resembling the discharge from scrophulous ulcers almost uniformly issues from their cut surfaces: hence, in part, originated the supposition that these substances were tumefied lymphatic glands. As the diseased structure of the lungs advances, this discharge becomes more decidedly purulent, and a greater quantity of matter is contained in each tubercle. When the tubercles have considerably increased in size, and several of them have united together, the larger bodies thus formed are termed *vomicæ*. Dr. Stark, who investigated with great accuracy and attention the nature and peculiarities of tubercles in their different stages, relates that he has frequently seen the blood contained in the vessels which open into these vomicæ or abscesses in a state of coagulation; and other anatomists have observed an almost constant contraction in the pendulous extremities of those branches of the pulmonary artery and vein, which are traced into these cavities.

Tubercles frequently exist in the lungs during the whole of life, without occasioning any observable symptoms. Their existence, however, may generally be presumed where, in consequence of trifling irritation, in whatever manner it may be induced, a short hecking cough is readily produced; and particularly if, during the existence of such cough, a degree of hectic fever be generated. To enlarge, however, on the characteristic marks of tubercular irritation, were to anticipate those observations which will be introduced with more propriety in another place. We shall proceed, therefore, to inquire into the origin of these bodies, and the manner in which they occasion that organic destruction which constitutes phthisis; and conclude the present subject with general remarks on other species of pulmonary disorganization, for the production of which the previous existence of tubercles is not required.

SECTION

SECTION I.

Origin and peculiarities of tubercles.

THE author has already alluded to the favourite and long established doctrine of acrimony, as the occasion of different characters assumed by variety in diseased actions.

Thus, a peculiar acrimony was regarded generally as the cause of scrophula: "the noxious acrimony prevailing in scrophula*" was supposed a frequent source of phthisis by its translation to the lungs; and the origin of tubercles was in this manner imagined to have received a satisfactory explanation. This doctrine likewise acquired an imaginary confirmation from the conceived identity, that has been already alluded to, of indurated lymphatic glands and pulmonary tubercles. And thus, from defective observation and erroneous theory, an individuality or insepa-

* Cullen's First Lines, vol. ii. p. 419.

rable connection was established of scrophula and consumption.

Total scepticism is frequently as inconsistent as implicit belief. When the existence of an acrimonious condition of fluids, as a cause of disease, was proved altogether unfounded, attempts were made to establish an entire similarity in every individual with respect to predisposition to disordered actions*. This is an error in the opposite extreme. An original variety in susceptibility has been already stated to be undeniable; and consumption is doubtless of more frequent and irresistible occurrence in some than in others. It may, however, be proved as unnecessary, perhaps, as it is contrary to strict philosophy, to have recourse to occult, indefinite, and totally imaginary conditions in the solids or fluids of the human body as indices

* "I have found, instead of the infinite difference of habits and temperaments, every individual precisely the same as every other."

Elements of Medicine, vol. i. p. 284, Dr. Beddoes' ed.

of

of these distinctions in constitutional character. Actual variety in structure may, perhaps, hereafter be demonstrated alone to constitute all the shades of variety in regard to diseased tendency. This opinion appears to receive support from a recollection of the circumstances that seem to create a more than ordinary susceptibility to the generation of tubercles.

It has already been stated, on the authority of respectable authors, that tubercles have been found in the lungs, the existence of which, during life, had not been suspected. This fact may be regarded as opposing their necessary connection with scrophula; but were we compelled to allow the indispensableness of the latter to the generation of the former, neither scrophula, nor its consequence, pulmonary tubercles, would therefore be with propriety determined to depend on "peculiar acrimony," or constitutional taint. Were the cause fully ascertained of that remarkable variety in relation to the facility with which catarrhal irritation is induced,

duced, such knowledge would perhaps, in a great measure, explain the mystery of tubercular generation. The great liability of the internal membrane of the lungs to be particularly affected during the existence of eruptive disorders of a certain kind, has previously been the subject of remark. The author has observed in his practice, that these catarrhal symptoms are in general produced with a promptitude and energy proportionate to the degree of constitutional susceptibility to what are termed scrophulous complaints; and there appears a similar liability in such constitutions to an irritation of this very vascular and sensible membrane from every other source. It may therefore be conceived, that those who by natural disposition are subject only in an inferior degree to colds or slight inflammations of the lungs, possess merely the same degree of constitutional tendency to the formation of tubercles in these organs; but that an equal irritation, if generated by artificial or extraordinary means, in a subject not naturally disposed to its production, would oc-

casion

casion effects precisely similar. This opinion appears to be further countenanced by experiments made upon animals, in which, by artificial means, genuine tubercular consumption was invariably produced; but, apparently, according to constitutional predisposition, the disordered actions were earlier or later in their production *. The results of these experiments deserve to be regarded as extremely important. Were consequences equally beneficial to the interests of humanity attendant upon the majority of experiments exercised upon the brute creation, the censure of the moralist, which the author fears has been applied with a severity too justly merited, would require considerable mitigation†.

The important fact ascertained by these trials evinces the impropriety of a fearless exposure to causes tending to produce pulmonary consumption, in consequence of a sup-

* Vid. Hygeïa. Essay on Consumption, vol. ii.

† "He who learns physiology at the expense of his humanity, I envy him not his feelings." Dr. Johnson.

posed

posed constitutional immunity from the occurrence of the disease; and perhaps proves that scrophula has no further relation, even to genuine tubercular phthisis, than by imparting an increase of susceptibility to those causes, which, operating to a certain extent, would invariably occasion the disorder.

Tubercles, then, may be regarded as the consequence of slight and repeated inflammation, originating in the mucous membrane of the lungs, and extending itself into the cellular texture of these organs, depositing the matter of which these bodies are constituted, that remains unabsorbed and inactive until excited into the formation of abscess by fresh and repeated irritation. When this inflammation is excited by causes that obviously act as mechanical irritants, the nidus of the tubercular bodies is frequently composed of a collection of such irritating materials, as in the instance of stone-cutters. This circumstance likewise occurred in those experiments upon animals above alluded to, where the matter which produced the disease was found

lodged

lodged in the centre of the tubercles, which were thus evidently generated from *external* sources.

SECTION II.

In what manner is consumption generated by the diseases treated of in the preceding chapters?

ALTHOUGH the precise and actual manner in which tubercles are occasioned may not hitherto have received a satisfactory explanation; from what has been demonstrated in regard to their production, the regular gradation may with facility be conceived, of incipient catarrh to genuine and confirmed consumption.

Every inflammatory affection of the mucous membrane of the lungs, whether occasioned by direct application to this peculiarly excitable surface, or consequent upon derangements of the general system, if by neglect or erroneous treatment it be permitted to increase or continue, may be regarded as en-

dangering the formation of tubercles. An accession of their numbers will be consequent upon the repetition of their cause: by union of those previously in a state of quiescence with what are recently generated, vomicæ are gradually occasioned, the contents of which at length penetrate into the bronchial cavities or air-vesicles of the lungs, and are discharged by cough, constituting the purulent expectoration characteristic of the final stage of this deplorable and now nearly hopeless malady!

Consumption, however, is not invariably produced through the medium of tubercles. Ulceration of the lungs not unfrequently originates as a direct and immediate consequence of hæmoptysis, or pulmonary hæmorrhage. Several examples of the disease produced in this manner have recently occurred in the practice of the author, where the origin and process of disorganization and formation of pus could be clearly traced to this source.

In a late work on consumption, by Dr. Bourne, pulmonary ulceration is described as capable

capable of division into three species:—the true consumptive ulcer; that formed in consequence of violent inflammation, or pneumonia; and that which is produced in an insidious and almost imperceptible manner. Much ingenuity and extensive observation are displayed in support of this division. That source, however, of pulmonic ulcer which we have just observed to be by no means infrequent, has been totally disregarded by Dr. Bourne. It cannot be denied that violent and repeated hæmorrhage from the lungs may be productive of extensive ulceration, independently of previous tubercles, and in a different manner from pleurisy and peripneumony; nor does it appear in any measure difficult to trace the steps by which hæmoptysis arrives at genuine and confirmed consumption. When rupture of blood-vessels occurs in the lungs, the greater portion of extravasated fluid is expectorated and discharged in the manner already described: a part, however, of this fluid, although thrown out from its appropriate vessels, may remain

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in the lungs, excite partial inflammation in these organs, which shall increase, extend, and at length terminate in fully formed ulcer*.

When ulceration is consequent upon pneumonia, the generation of purulent matter is occasioned upon similar principles to those which regulate the process of inflammation in other parts of the body. It has been with propriety observed, that, "inversely with respect to what is observable in the consumptive ulcer, the matter is brought up in the ulcer produced by pneumonic inflammation in largest quantities when ulceration first takes place, and decreases in quantity afterwards." In this manner purulent discharge from the lungs has often been remarkably

* In some instances pulmonary hæmorrhage has been observed to a very considerable extent, and has likewise recurred frequently without the production of ulcer. Merely in consequence of the violence of repeated irritation, the substance of the lungs is sometimes gradually destroyed, without the intervention of any other disorder.

copious when ulcer has succeeded active inflammation, and the patient has, notwithstanding, entirely recovered. It has, indeed, been conjectured, that a favourable issue is most frequent in the circumstances now under consideration. The experience, however, of the author of these pages by no means justifies this conclusion. Although in this form of pulmonary ulceration the mere quantity of purulent matter discharged is not, as in the genuine phthisical ulcer, a principal indication of the degree of danger; yet, where large quantities of pus have been actually thrown out from the substance of the lungs, expectations of recovery, in the majority of instances, rest upon a foundation extremely slender.

Inflammation of the lungs sometimes originates from external violence which may be applied merely to one side of the chest, and in such case the morbid action which is generated has been known likewise to be partial; a considerable quantity of purulent matter has been sometimes formed in one of the

the great divisions of the lungs, has penetrated the bronchial cavities, and been poured out from the mouth, or has discharged itself into the thoracic cavity, forming the disease denominated *empyema*; while the functions of the opposite lung have proceeded with scarcely any observable interruption. The possibility of this circumstance is rendered obvious by a recollection of the anatomy of the pulmonary organs, on which we have previously descanted. It is, however, a circumstance comparatively infrequent, and is almost entirely confined to inflammatory disorders arising from extraneous and mechanical injury.

CHAPTER X.

Persons more or less liable to pulmonary consumption.—Temperament.—Age and sex.—Professional occupations.

THAT genuine consumption occupies so conspicuous a situation in the large catalogue of maladies peculiarly prevalent in the British islands, must be rather a subject of regret than surprise, to every one who connects in idea the structure, œconomy, and nice susceptibilities of the pulmonary organs with the ever-varying nature of the climate of this country, and the mode of living adopted by a great number of its inhabitants.

When it is recollected, that apparently the most trivial variations in external temperature, or the slightest alteration in the nature and qualities of inspired air, may, under circumstances of peculiar irritability, produce inflammatory irritation or even rupture of blood-vessels

vessels in that large expanse of vascular and very excitable surface, which, by situation and office, is thus constantly exposed, the frequent occurrence and fatal termination of pulmonary affections appear to receive a full and satisfactory explanation. There is however, as already stated, an acknowledged variety in constitutional tendency to genuine phthisis, from whatever source it may originate. The destroying angel, while requiring general retribution for certain deviations from nature, marks particular individuals for primary sacrifice. Although no one ought fearlessly to expose himself to the causes of consumption, every one has not an equal cause for fear. As preparatory, therefore, to general instructions on the means of avoiding the attacks of phthisis, it becomes necessary to point out the subjects to which such instructions more immediately and particularly apply.

Natural organization, age, sex, and professional or other occupations and habits, may, perhaps, be made to include every peculiarity of

of disposition to pulmonary consumption, whether native or adventitious; or, in the language of systematics, will comprehend the prædisposing and exciting causes of this formidable and destructive malady.

The principal and primary source of prædisposition is to be traced to temperament* or organic structure, which consequently requires the most particular consideration, as it relates to the application of preventive or defensive measures.

SECTION I.

Organization.

THIS is of two kinds. Organization may apply to the mere form and structure of the corporeal frame, or the mechanical and physical condition of the several materials that

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* The word temperament is here employed merely in compliance with ordinary language. The theory by which it was introduced is altogether erroneous.

are

are ingredients in its composition. An infant, for example, may be born with defective structure in the pulmonary system, while constitutional tendency to the disease may be inferior to another in whom such external character may not be remarkably prominent.

An erroneous or faulty construction of the chest and lungs, exclusively considered, has been, perhaps, regarded in too indiscriminate a manner by the generality of writers, as an indication of consumptive disposition. The author has observed several instances of confined narrow chests without the simultaneous existence of catarrhal, inflammatory, or hæmorrhagic dispositions in a more than ordinary degree; and where, consequently, there has existed no particular susceptibility, in consequence of external structure, to pulmonary consumption. It must however be acknowledged that the phthisical form, as described by authors, is for the most part, although by no means invariably, connected with other signs of the scrophulous temperament, and in these instances is particularly deserving of remark.

That

That peculiarity of pectoral conformation to which the term narrow-chest is applied, is occasioned by the sternal or breast-bone being pressed too much in upon the substance of the lungs: thus the clavicles and shoulder-blades are thrust out from their proper position, and made to assume in some measure the form of wings, to which indeed they have been with propriety compared, just raised from the body and about to expand for flight. By this internal direction of the sternum the full expansion and proper sweep of the ribs is likewise prevented, and an unnatural curvature or prominence is occasioned on either side of the breast, with a corresponding central depression. When such mal-conformation of the thorax is connected with the scrophulous temperament, the neck is generally observed disproportionably long, the temples hollow, the cheek-bones particularly elevated; and some authors have described as a characteristic, what, however, is by no means constantly observable, a remark-

able

able prominence in the processes of the os sacrum*.

But to the signs of scrophulous or particular consumptive tendency, independently of the mere form of the body, attention is likewise required. These are generally said to be a fair skin or delicate complexion, blue eyes, for the most part large and full, fine teeth, and great physical irritability.

The indications, however, which are pointed out by the generality of authors, of more than ordinary disposition to phthisical and scrophulous affections, are by far too general and indiscriminate; and, very frequently, almost the reverse of those above stated are tokens both of the consumptive and scrophulous habit.

Three varieties of constitutional prædisposition to scrophulous ailments, as characterized by external marks and general suscepti-

* Vide Simmons on Consumption.

bilities, admit, perhaps with some degree of accuracy, of separate delineation. As this observance is particularly important in relation to preventive medicine, the author will not be regarded as unnecessarily particular in stating the result of his observations with respect to these peculiarities.

It has been with propriety observed, that "other tokens of scrophula frequently occur with black hair and dark eyes;" and in these subjects the phthisical disposition is perhaps for the most part more exquisitely marked than in any other. Under the first variety, therefore, of those who by temperament are remarkably obnoxious to this affection, the author would class the weakly and irritable, who, with transparent skin or fine complexion, have dark hair and dark eyes. In these subjects, the external marks of scrophulous derangement immediately to be noticed are of less frequent occurrence. The constitution is characterized by great sensibility to external impression; and as youth advances, the mental affections display themselves, if not

with

with extreme vividness, with much facility and force. Impressions are readily made, but not so easily erased. A peculiar disposition to hæmorrhage from the nose and lungs in early life characterizes this temperament, and from the latter more particularly, at that critical period when sexual peculiarities are about to be developed. Sound teeth, with a peculiar degree of whiteness and transparency, have been said to attend every species of consumption*. This is by no means the case: but in the constitution we are now describing, there is perhaps less disposition than in any other, to caries in the teeth, which have in general a more than ordinary appearance of transparency or vascularity.

The characters which have already been enumerated as denoting consumptive tendency according to the generality of writers, more particularly and properly, perhaps, apply to the second variety. In these constitu-

* Vide Simmons on Consumption, p. 11.

tions

tions there is an extraordinary liability, from slight changes of temperature, to those glandular affections of the neck which are vulgarly termed the kernels or almonds of the ears. From accidental circumstances, discharges of blood from the nostrils frequently occur in early life; but hæmorrhage from the lungs, about the period of puberty, is by no means equally general, or occasioned with the same facility as in the preceding variety. Scrophulous affections of the joints in these constitutions are particularly prevalent; but liability to disorganization of the lungs does not appear so remarkable as in the temperament above described, unless assisted by defective conformation, or other adventitious circumstances. The teeth are frequently sound, and free from caries, but not perhaps in so observable a degree as in the former case. Affections of the mind are vivid and transient; and indeed the constitution, mental and bodily, approaches nearer to what has been generally termed the sanguine temperament.

In the third variety are observed symptoms nearly the reverse of those immediately preceding. This last has been termed the phlegmatic scrophula, by a modern author, in compliance with medical nomenclature. The former characters of extreme irritability are here exchanged for a considerable degree of torpor. The impropriety of supposing an absolutely necessary connection between consumption of the lungs and scrophula, is perhaps illustrated by this variety of scrophulous temperament; for here there is a marked prædisposition in a superior degree to glandular derangement, while susceptibility to impression from causes productive of phthisical disorganization, is by far inferior to that observed in other instances where no positive indications of scrophula shall have preceded the pulmonary disorder. Tabes, or general consumption, is perhaps more frequently ingrafted on this temperament than consumption of the lungs.

The colour of the eyes is here, for the most part, but not necessarily, gray, the pupil large

large and fixed, the upper lip tumid, the hair is indifferently light or dark, complexion pale, but always suffused with hectic, partial, and transient redness, when absolute disease takes place of mere prædisposition. No peculiarity is observable in the teeth, excepting the comparative tardiness of their appearance in infancy. The mind partakes of the bodily torpor and indisposition. As growth advances, which is generally tardy, and often marked by extreme irregularities in consequence of insufficient deposition of bony matter, constitutional tendency is not to hæmorrhage from the lungs, or inflammatory affections of the joints, but more particularly to tumefaction of lymphatic glands, scrophulous ophthalmia in a remarkable degree, and general derangement of secretory organs. But the circumstance which requires particular and attentive observation, as characteristic of this general torpor, is that enlargement and hardness of the belly, to which infants of the constitution now described are so remarkably disposed. This

is a symptom almost constantly present. It arises from debilitated and deranged action in those glands by which the food is assimilated and formed into chyle: a general atrophy and obstruction of growth is therefore the necessary consequence of its existence to any considerable extent.

Such are the principal expressions of that general debility in the vital power consequent upon defective organization, whose origin and connection have been in general erroneously conceived, and whose characters are for the most part imperfectly pourtrayed. Scrophula, it may be repeated, has no further connection with *pulmonary* consumption, than as it displays a more than ordinary disposition in the internal membrane of the lungs to acknowledge certain agents on the operation of which depends the formation of the disorder. Of every species of scrophula debility is the primary source. In those species which have been arranged in the two first orders, this debility appears to be

be connected with a peculiar irritability to powers which excite the action of the arterial and nervous systems, while excitability in the lymphatic system of vessels exists in an inferior degree. In the latter variety an universal torpor pervades the whole frame, while the particular characters of debility appear more remarkably in the altered and deranged functions of glandular parts. In no case are the disorders engendered from the scrophulous temperament dependent upon an acrimonious impregnation of either solids or fluids. It is a debilitated condition in the living fibre, and consequent diseased action, that constitutes every form of scrophulous ailment. When treating of the operation of digitalis as a remedy for consumption, further remarks will be introduced on the peculiar nature of scrophula, and its connection with phthisis. To prevent misconstruction, it may here be observed, that the divisions above attempted have no pretensions to undeviating or entire accuracy. So complicated, various, and dependent, are the

the structure, functions, and disorders of the human frame, that both constitutional character, and diseased symptoms, will ever elude all attempts at exactness of arrangement.

SECTION II.

Age and sex.

It is generally known that decided symptoms of phthisis, for the most part, commence about or soon after the period of puberty. The cause of this appears sufficiently obvious. At this period an important revolution is effected throughout the universal frame. New determinations, as they are expressed by physiologists, arise; organs, previously in a state of torpor, are evolved; fresh faculties and functions are developed, and new actions generated. The pulmonary organs experience at this time a very considerable alteration, and their sympathies with other parts are greatly extended.

extended. It is not, therefore, surprising that the germ of disease, which had been hitherto atent, should be made at this period to unfold and expand. Females are more liable to consumption than males. This circumstance appears in some measure susceptible of a similar explanation. Female organization is both more complicated and irritable, and consequently in a superior degree prone to derangement at particular periods. The natural weakness peculiar to the sex is likewise too often increased by an improper compliance with the capricious requisitions of fashion and taste. This subject, however, is referred to the succeeding chapter.

SECTION III.

Occupations in life.

The origin of phthisis from exposure to direct sources of irritation has hitherto received

ceived less attention from practitioners in Britain than elsewhere. Air rendered noxious in quality by a chemical alteration of its constituent parts, or mechanically united with foreign materials, has already been said to have the power of producing, independently of temperature, catarrh, pneumonia, tubercles, hæmoptysis, and, at length, genuine and confirmed consumption.

To irritating substances which operate upon mechanical principles, the lungs of every individual are in some measure obnoxious. Certain artificers, however, are by the nature of their employments more obviously and constantly exposed to this frequently insidious source of pulmonary irritation. "Stone-cutters, millers, flax-dressers, and some others *," are stated by

* "Dr. Kirkland observes, that scythe-grinders are subject to a disease of the lungs, from particles of sand mixing with iron dust, which among themselves they call the grinder's rot."

Simmons on Consumption, page 11.

Dr. Cullen to be most particularly disposed, from their occupations in life, to pulmonary affections. "But the most striking example," says another writer, "of this species of injury is afforded by one of the processes in the needle manufactory:—it is that of *dry* grinding, by which the needles are pointed. The persons employed in this labour are universally affected in a short time with the symptoms of approaching consumption. They go on coughing, till they either spit blood, or a thick substance having the appearance of matter. They decline in flesh and strength, and scarcely ever survive to the fortieth year." In this instance a remarkable and melancholy demonstration is afforded of the mechanical injury occasioned to the lungs by constantly inhaling irritating particles of matter: and it is properly inferred from these prominent facts, that exposure to a certain degree of similar irritation is necessarily connected with other professional occupations, in which the

the artisans are confined in air thus artificially impregnated.

Such causes, however, seldom operate in an exclusive or independent manner. That posture of the body which is unfavourable to freedom of circulation is frequently connected with much confinement in the instances now referred to; and these last circumstances in an extraordinary degree augment the original, or in any measure acquired, disposition to consumptive affections. Confinement in warm and close apartments is particularly injurious. The author has frequently observed the phthisical tendency greatly increased, and in some instances apparently generated, from this cause alone; and a surgeon of London, whose opportunities of observation are very extensive, relates of the gilders in this city, who work in heated rooms, "that six out of seven are said to die consumptive in their apprenticeship." In short, all whose employments confine them to sedentary habits and confined

fined apartments are extremely liable to this fatal disease.

While professional occupations attract such large numbers within the sphere of its influence, other employments appear in a great measure to counteract a tendency to pulmonary consumption. Butchers, sailors, watermen, husbandmen, gardeners, stable-boys, and others have been observed remarkably exempt from this malady :—a chemical explanation of such immunity has been unsuccessfully attempted, and medicinal treatment founded upon these principles unsuccessfully employed. Such exemption from phthisical disorder has been recently, and with greater propriety, attributed to the occupations above mentioned being " carried on in the free air, and fully supplying the means of answering the calls of appetite." Hereditary constitution may be regarded as in some measure tending to direct the balance to the favourable side. The husbandman and the sailor, while following the vocation, partake likewise in the greater number of instances of the

the hardy and almost irresistible frames, of their immediate or more remote progenitors.

We shall now proceed in the ensuing chapter to treat of the manner in which the phthisical tendency when formed is most effectually obviated.

CHAP.

CHAPTER XI.

Means of counteracting the phthisical tendency.— Observations on diet and regimen. — British clothing and habitations. — Exercise. — Bathing.

"Quod si hæc *irritamenta* solicitè fuissent vitata non video cur morbus per totam vitam non siluisset."

Heberden. Commentarii, pag. 324.

THE ardent imagination of a learned and celebrated writer has indulged for a considerable period in anticipation of the supposed advantages accruing to society, from an extended diffusion of medical physiology beyond the boundaries of professional enclosure. To subvert the foundations and expose the fraudulence of every form of empiricism, and to inspire a firm and efficient regard for personal, physical, and even moral welfare, requires, according to our author, nothing

nothing further than a steady direction of public inquiry into appropriate channels of general information.

This fair prospect of universal improvement receives, it is feared, an imaginary extension and fictitious beauty from the medium through which it is surveyed. "Knowledge is power*:" but, unfortunately, there are other powers and principles operating on human nature which too frequently display a counteracting predominance. "The lure of high wages," it is confessed, is sufficiently attractive to engage men in practices to which is attached a *certainty* of eventual destruction, as in the instance of that branch of manufactory to which particular allusion was made in the preceding chapter; and the same disposition to acquire temporary gain, at the expense of permanent deprivation, will be found generally operative through every class of society. It is not from a deficient knowledge of cause and effect that

* Lord Bacon.

the youthful voluptuary rushes into courses which necessarily either curtail the period of existence, or eventually abstract from the "sum of pleasurable feeling." "The rash momentary propensity of the pupil*," experience too frequently and fatally convinces, is not to be "checked by the enlargement of his views." Lord Verulam's practices were diametrically opposed to the elevation and rectitude of his principles; and the greatest devotedness, even to the lowest species of sensual gratification, is often connected with extended knowledge of the physical and moral condition and susceptibilities of man.

The circulation, however, of medical philosophy of a proper kind, will inevitably be attended, at a more moderate calculation, with important advantages to the interests of society. When "medicine, like other branches of natural knowledge, is brought

* Dr. Beddoes.

from

from its hiding-place, and exhibited in the simplicity of science and the nakedness of truth*," its precepts will be more generally and highly valued, and the merit of its professors more duly appreciated. "Empirics will be under the necessity of burning their miserable wares," professional mediocrity will find its level, and proper sources of relief will be applied to when remedies are required.

It has been the author's endeavour throughout to avoid as much as possible the peculiarities of technical phraseology, and to render the language of this work intelligible to the unprofessional reader.

Should the contents of the present chapter assume a character particularly popular, the medical reader will recollect, that the author is sanctioned in such apparent deviation from regularity by the first and brightest names in his own profession.

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* Dr. Currie.

In considering the proper means for correcting the phthisical disposition, and regulating health, it appears scarcely necessary to allude to those more obvious and direct sources of pulmonary disorganization which certain professional occupations supply in so decided a manner. The author, however, may with others express surprise that precautions are not taken to avoid as much as possible the immediate application of irritating particles to the lungs, by means of a covering to the face, which might with facility be made to defend these irritable and important organs without impeding respiration. That these exciting causes do not, however, in the majority of instances, operate without the powerful concurrence of other circumstances, we have already ventured to suggest; and it will, therefore, be unnecessary to observe, that the preventive plan requires in general to be pursued upon a much more extensive scale than that of the mere exclusion of mechanical or chemical irritants.

In treating both of the prevention and cure of pulmonary consumption, authors have for the most part entered into a minute consideration of the various and respective advantages and disadvantages of certain climates and countries. The majority, however, of invalids menaced or affected with this formidable complaint, are prevented by domestic circumstances and connections from effecting a permanent or even temporary removal from Britain ; and it may be questioned whether the peculiar virtues of climate, in obviating the tendency and arresting the progress of phthisis pulmonalis, have not in general been calculated upon from insecure data. Those countries in which a regular and temperate warmth is preserved throughout the greater part of the year, are undoubtedly most favourable to persons who have a constitutional propensity to consumption, the generation of which is so obviously and intimately connected with sudden variations in atmospheric or external temperature. From recent investigations, countries in which

which the extremes of heat prevail, have been supposed particularly exempt from this disease; and the southern parts of Europe, to which the opulent patient has hitherto almost invariably been directed by the British physician, has been judged to be inferior in virtue in obviating consumptive tendency to the East and West Indies. To this conclusion the observations of others appear to afford some exception. "It has been supposed by many," says Dr. Winterbottom, "that a hot country is favourable to consumptive patients, but I have found the reverse of this to be true. Among the Nova Scotia settlers at Free Town, consumption occasionally appeared as a sequel of other diseases; and in every instance the fatal period occurred much sooner than it would have done in others*."

* An Account of the Native Africans in the Neighbourhood of Sierra Leone, by Thomas Winterbottom, M. D.

In the preceding chapter the general characters of phthisical disposition were pourtrayed: in the present it is the author's intention in a very general manner to point out the proper method of counteracting this disposition, as well during the period of infancy, as when the disorder for the most part is about to commence a decided character and regular gradation. This investigation will be universally acknowledged to be of greater importance than to ascertain in what region of the globe consumption does or does not prevail, although statistical observations in relation to disease in general cannot in any measure be regarded as superfluous, or inapplicable to the prevailing disorders of the British climate.

SECTION I.

Dietetic and medicinal regimen.

Many foreign writers have with great impropriety attributed the extreme frequency of

of phthisical disorders in this country to the quantity of animal food consumed by its inhabitants. This assumption is in total contradiction both to principle and experience. It has already been observed, that where the demands of appetite are duly and regularly supplied, with other favourable circumstances, consumption is an unfrequent visitor; nor, indeed, is it a common attendant upon courses even of inordinate or intemperate indulgence in this species of gross sensuality. The majority of consumptive invalids are to be found among the feeble and effeminate; and in many instances the disease too evidently results from deficiency rather than excess of animal diet. In a recent publication by Dr. Hall, containing many original observations on the condition of different ranks of people in this country, it is stated, that the average number of deaths during infancy among the poor and indigent classes of society is in the proportion of two to one; and the great mortality of infants in the northern extremities of the British island has been frequently

frequently observed, and with propriety attributed to deficient quantity and quality of nourishment. In the public institution to which the author is professionally attached, many instances daily present themselves of diseases, both in the infantile and adult period of life, which are too obviously consequent upon a deficient supply of salutary and nutritious aliment; and where there has been an hereditary disposition to this peculiar expression of deranged function, consumptive affections may be traced with facility to the operation of this cause, combined with the positive action of those artificial or unnatural stimuli that are too frequently had recourse to as a necessary substitute for wholesome nutriment. Even in the more affluent classes of society an improper restriction of nutritious diet, particularly in the earlier and dependent periods of life, with the concurrent action of certain *medicinal courses*, have too often served to render more decided and prominent the original features of a weakly and irritable habit. Medicine, by its improper

and empirical application, whether professional or popular, has conduced in this country to premature death, and direct excitation of pulmonary diseases, more than even the misemployment of otherwise nutritious food. A course, then, with respect to the articles of diet, opposite to that frequently pursued, both in infancy and during the important interval between this and the period of puberty, is to be earnestly recommended. Many consumptive affections have been originally implanted in the nursery, fostered by boarding-school regimen*, and made to ex-

* Not long after writing the above sentence, the author met with a remarkable corroboration of its truth in the instance of a young lady who has been constantly subject to pectoral complaints of an alarming nature with every returning spring, that were evidently excited by a severe restriction from nourishing diet during her boarding-school years. Several very important, and to guardians of families incalculably instructive facts in reference to schools, will be found in the Hygeïa of Dr. Beddoes.

pand by *infallible* remedies for coughs, colds, and consumptions. No moral dercliction of principle or habit can excite feelings of compassion, and indignation, equal in poignancy to those occasioned by the contemplation of a youthful female directed by force, or allured by artifice, into courses which necessarily deprive her of every prospect of future reputation and felicity. That hardy empiricism, however, which for individual profit occasions permanent and irreparable injury to the health and consequent happiness of either unconscious or unsuspecting individuals, deserves, in an equal degree, the severity of reproach ;—nor can the plea of ignorance of consequences justly claim any thing further than a slight mitigation of the austerity of censure.

From what has already been remarked in the present work, the unprofessional reader may with facility conceive the susceptibility of the pulmonary organs to irremediable disease,

disease, from an improper course of irritating remedies prescribed indiscriminately for particular symptoms. "Consumption is a vast pit-fall, situated on the high road of life." Empiricism is the treacherous hand which, under false pretences, conducts to its margin and precipitates the fatal descent. When the English nation shall be firmly convinced, that "sweeteners of the blood*," "antiscorbutics," "remedies for colds," and, according to the observation of the astonished Chinese philosopher, "for every disease to which the human frame is subject†," are

* It cannot be impressed too forcibly on the public mind, that the idea of counteracting a disordered condition of the blood is fundamentally erroneous. In the most virulent diseases, whether chronic or otherwise, the blood is invariably found free from taint. In the more advanced stages even of sea-scurvy the blood is without any appearance of putridity; and it is a fact universally known, that contagious diseases are not to be communicated by an interchange of the vital fluid.

† Goldsmith's Letters of a Chinese Traveller.

either

either altogether inert, or highly injurious by their indiscriminate administration, and shall direct its attention to the judicious regulation of diet, clothing, and other means of counteracting the rigour of an inclement climate, disease in general will be of less frequent occurrence, and the list of consumptive affections will undergo a very considerable diminution.

In the remarks which were made in the preceding chapter on the connection of scrophula with phthisis, one species of scrophulous debility was described as indicated particularly during the period of infancy by hardness and prominence of the abdomen. This symptom, when existing to any considerable extent, is both the cause and effect of extreme weakness: it arises, as we have observed, from an undue and debilitated action of that series of glands whose regular and salutary performance of their functions is constantly necessary to the pro-

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per assimilation of nutritious aliment, and consequent health and growth of the body. As a consequence of this derangement, the functions of the whole length of the alimentary canal are disturbed, digestion is impaired, acid eructations, and vomiting in some instances occur; the alvine discharges are discoloured and irregular; convulsive actions, the effects of debility, arise, of which the most prominent is frequently a troublesome and protracted cough. All these affections may, for the most part, be dissipated, with freedom and facility, by air, exercise, and a regular supply of nutritious diet, which should consist of animal matter rather than the fermenting substances, which more usually compose the principal food of infants.

An opposite course, however, under the circumstances now alluded to, is in general pursued. Worms, or mechanical obstructions, are vaguely supposed to occasion these irregularities in the stomach and bowels.

Debilitating cathartic medicines are poured

 in,

in, balsamic indigestible substances are administered to allay the cough, and the suffering infant at length perishes from atrophy; or, if the enfeebled powers of nature still suffice to preserve existence, the irritative actions are directed to the lungs, inflammation and tubercular disposition are generated, and the constitution radically and irrecoverably impaired*!

Consumption of the lungs was said, however, frequently and more generally to be ingrafted on debile habits of a different nature; and here likewise the seeds of the disease are frequently suffered to impregnate the constitution in early life.

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* It may, perhaps with propriety, be asserted, that the majority of coughs, both in the infantile and adult period of life, originally proceed from a disordered state of the stomach, independently altogether of primary affection in any portion of the lungs; and in this case are alone to be counteracted in their earlier stages by tonic and generally invigorating remedies.

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When considering the subject of inflammatory affections of the lungs, particular allusion was made to that irritation of the pulmonary organs in infancy which is frequently produced by eruptive affections. This irritation, with respect to its degree of violence, in a great measure depends upon external causes. The mucous membrane of the lungs has, however, been previously observed to possess, in some instances, a more than ordinary excitability; and this peculiarity is displayed in what may be termed the irritable species of scrophula, to distinguish it from the indolent or phlegmatic kind. In this case, the injury occasioned to the pulmonary organs from the generality of irritating cough medicines, is more obvious and extensive. The important agency of foxglove (digitalis) as a preventive of consumption, so frequently generated from this cause, cannot be too earnestly or repeatedly enforced; and the author fully accedes to the opinion of Dr. Currie, that " in families where this fatal disease (phthisis pulmonalis) is hereditary, the use of this remedy as a prophylactic

phylactic will save many a life that would otherwise have been cut short." In those irritative coughs of young persons, which, when violent, denote at least the tendency to tubercular deposition, a timely administration of foxglove will, in a great measure, as we have previously observed, supersede the employment of other medicinal agents, and thus destroy the germ of phthisical growth. Its extreme activity, however, and other circumstances, oppose the propriety of its unprofessional or popular administration; and indeed in this, as in all other cases, the public is to be instructed rather how to *avoid* the occurrence of disease and the necessity of medicine, than furnished with abstract rules, which are necessarily incapable of application, respecting the virtues and doses of drugs. "A little cough may be the sign of a great disease. Beware then how you play the doctor's part. Would you consent to be turned blindfold into an apothecary's shop, and give your child the first drug you may lay your hands on?"

SECTION II.

Clothing and habitations.

THE subject of clothing resolves itself into two points of consideration. Particular modes of dress may be injurious, either as they relate to impediments in the growth and functions of the body from inequalities of pressure, or by occasioning an improper exposure to irregularities in external temperature. Peculiarity, however, of constitutional sensibility to the effects of mechanical force, externally and improperly applied, is, for the most part, attended with a concurrent degree of physical sensibility to the powers of heat and cold.

In many anatomical courses of lectures, a forcible demonstration is exhibited of the almost unlimited power of external pressure to model the structure and direct the growth of animal organization. Human sculls, in particular, are preserved of a variety of forms, originating entirely from the kind and degree of pressure which the *fashion* of uncultivated and

and barbarous nations directs to be applied to the head during the period of infancy. More important and deplorable examples of the same principle might be collated from a comparison of the thoracic structure of individuals, where nature, in this respect, had suffered no sophistication or restraint, with that of the more refined nations and classes of society, where the influence of preposterous fashion had been in vain opposed by every principle of propriety and every dictate of feeling.

Anatomical demonstrations are, however, not required either to illustrate or apply the important fact of the extensive and injurious tendency of pressure on the pulmonary organs, to vary external form or create irreparable injury to internal organization. Mr. Cline is accustomed publicly to relate, and particularly to impress, the circumstance of his having been consulted by a lady, a mother of a numerous family, the female individuals of which were all, without exception, sickly and mis-shapen, until, by his direction,

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the usual form of confined habiliment was laid aside, and dress was henceforth accommodated to the requisition of nature; that is, all pressure and tight bandaging was entirely abandoned: and the consequence was, unimpaired health in the succeeding children, in place of extreme feebleness and comparative deformity.

"Very straight lacing and straining for a fine shape," says a learned author of the preceding century, "hath made many a fine girl spit blood, and ruined the lungs by preventing a full and free respiration;" and it will perhaps be unnecessary to repeat, that disposition to injury from this source, although existing in a larger or smaller degree in every individual, is proportionate to natural tendency to phthisical affections. Every form of pressure from clothing, or articles of dress and ornament, is therefore in every instance, but more especially in the consumptive, to be sedulously avoided.

These cautions may perhaps, in the present day, be deemed unnecessary, since modern

fashion

fashion has happily effected what taste and reason in vain endeavoured to accomplish. "The old plan, however, of severe constriction, much oftener than is suspected, lurks below the free Grecian flow of the external habit;" and tight ligatures and different forms of bracing still continue to obstruct the growth and essentially to injure the health of susceptible and delicate females, particularly in the earlier period of life,—to augment, and perhaps in some instances actually to confirm, the original or constitutional tendency to phthisical disorganization.

The perversion of the purposes of clothing is, however, principally conspicuous in the present day, and in Britain more particularly, in relation to defence from inclemencies of the weather. Almost every other country, whatever may be the rigours of its climate, enjoys a comparative exemption from pulmonary consumption. The extreme rapidity with which considerable variations in temperature are effected in these islands, is perhaps the principal source of our large majority of these

these disorders: but this natural defect of climate appears to be artificially and very materially assisted.

The author, a few months since, received a communication from sir John Sinclair, on the comparative infrequency of catarrhal, phthisical, and rheumatic affections, in Russia, and other parts of the north of Europe; in which the remarkable immunity of these nations from such diseases was attributed in a great measure to the employment of furs, cloaks, and other modes of clothing, which preserve an uniformity of warmth throughout the body; to the great care taken by all classes of people to preserve the *feet from cold and damp*; to the different modes of communicating heat to their apartments; and to the constant use of the vapour bath. With this opinion that of a writer of celebrity appears to coincide. In a communication to Dr. Beddoes, which this physician considers "one of the most valuable contributions towards the history of the health of nations that has ever been presented to the public,"

 Dr.

Dr. Cogan, who resided for a considerable period in Holland, thus writes:—"I remember, when I had the pleasure of seeing you, to have remarked, that the Dutch, and even the English who had resided some time in Holland, were forcibly struck with the coughs, whether catarrhal or consumptive, so universally present in this country (England) at almost every season of the year. At church, and at the theatre, devotion and pleasure are always interrupted, and sometimes totally destroyed, by incessant coughing and expectoration; while in the largest assembly in Holland instances of a similar kind are hardly known. This very striking difference I have been induced to ascribe to the contrast observable between the two countries, *in the construction of their habitations and in the peculiarities of dress*."

Without entering into a detailed account of such peculiarities, it may suffice to observe, that those of the nations alluded to are such as effectually to secure against rapid transitions from cold to heat, and to preserve the body

body from *partial* exposures to either of these powers. The apartments in these countries are so constructed as to preserve a moderate and equal warmth, and the mode of dress insures the same equality of temperature.

By combining, therefore, the advantages of equable covering with those of ornament in the article of dress, by a careful preservation from *chill in the feet,* while the other parts of the body may be artificially and irregularly heated; by adapting clothing rather to the state of the weather than to the fashion of the times; and by avoiding, as much as possible, confinement in close and heated apartments, which are necessarily heated in an irregular manner; susceptibility to consumption will be considerably diminished.

Writers on preventive medicine are accustomed, with great propriety, to caution the public in a more particular manner against exposure to damp. Cold, combined with moisture, is peculiarly inimical to the con-

sumptive

sumptive constitution. This perhaps, in a great measure, depends upon the superior density of water to air. Some physiologists have indeed attributed a peculiar or specific quality to moisture, independently of its cooling power. Every form of damp, however, in connection with cold, is carefully to be avoided by the phthisically disposed, whatever may be the principle on which its noxious effects are displayed. In fine, the sensation of chill, whether partial or general, particularly if considerable, and long continued, is to be regarded as attended with extreme danger. A modern writer has observed, that it is no uncommon thing to find the origin of consumption distinctly referred to a chill received at church; and adds, that from the coldness of many of these structures, the cold bath itself cannot be more dangerous to the unhealthy.

SECTION

SECTION III.

Exercise.

As, in relation to diet and clothing, to preserve regularity, avoid extremes, and accommodate practice to the demands of nature, which are displayed by the feelings and instinct of the individual, constitute the greater part of preventive regimen; so, in respect to exercise, its conduct and regulation are to be guided rather by the actual circumstances and sensations of the patient, than the indiscriminate application of abstract precepts.

Consumptive disposition is, however, frequently connected with indolence of habit; and in such instances it becomes necessary to create a motive of sufficient force to overcome listlessness, and impel to a certain degree of corporeal exertion. In relation to exercise, one principle, which is too much disregarded, should never be forgotten; and this principle particularly applies to those cases in which constitutional debility, in connection

nection with extreme irritability, prevails to a very considerable extent. Temporary exertions do not compensate for general habits of inactivity and indolence. On the contrary, these transient struggles against the oppression of weakness, serve rather to produce a still further reduction of the powers of the system, already greatly impaired, and thus confirm the disorder they are intended to remove. This law regulates the application of every power by which life is maintained, or exhausted strength renovated. " It holds through all the gradations, from the convalescent in fever, that cannot bear all at once to be raised upright in his bed, to the phthisical and the nervous, who are fluttered with palpitations, dissolved in languor, or teased with head-achs, after every movement a little more brisk than usual."

The kinds of exercise are necessarily to be accommodated to the sex and circumstances of the patient. Those which are carried on in the open air, and excite an interest independent on the conviction of their utility,

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are greatly to be preferred; but objections against those of a different nature have perhaps been urged in a manner too systematically minute. The author has frequently seen the dumb bell an useful appendant to the furniture of a college apartment; and expedients of this nature to expand the chest, and obviate the inconveniences of sedentary habits and employments, frequently at the same time afford an agreeable relaxation from business or study, by exercising without producing fatigue.

It has already been observed, that phthisical invalids, particularly where the hæmorrhagic disposition is evidently marked, should cautiously abstain from violent exercise of the lungs, occasioned by singing, or performing on wind instruments of music. Dr. Beddoes relates, that "he has been several times consulted for invalids in whom a pain of the side had come on while they were learning to sing, and in whom it disappeared after relinquishing the practice." Pain in the side, however, it may be observed, is by no means a positive

indication

indication of even incipient disorder in the lungs. It will frequently be occasioned with greater facility in those who are not constitutionally disposed to phthisical complaints, and is often produced by a debilitated or irregular action of the external pectoral muscles; in which case, impeded or otherwise deranged circulation, if it occur, is merely a consequence, and not the occasion of the derangement, from which proceed the painful sensations that are experienced. It is of incalculable importance accurately to discriminate between spasmodic and inflammatory affections. Venæsection has frequently been enjoined in instances of pain in the side or chest, where stimulating and invigorating remedies were urgently required and exclusively admissible. Thus, consumptive disposition has frequently been engendered by the means employed for its removal.

SECTION IV.

Bathing.

WHEN treating of the production of catarrh, the author endeavoured to prove, that the principal error, which, previously to the dawn of a true philosophy in medicine, attended speculations on the action of heat and cold on the living system, was founded on deficient attention to the peculiar laws and characteristic properties of animate existence. Cold, when applied to certain substances, condenses and strengthens, by altering the arrangement of the particles which enter into their composition. Heat, as the opposite power, necessarily displays opposite effects. The one corrugates and renders tense, the other expands and relaxes.

By an illegitimate application of these properties to living matter, cold has been universally regarded as a tonic, heat a relaxing power. Cold bathing was indiscriminately supposed to be corroborative: on the contrary,

trary, immersion in warm water was imagined invariably and directly to enervate.

These principles are not merely erroneous, but have been productive of considerable injury, by encouraging an indiscriminate employment of those means to obviate constitutional debility, and restore exhausted strength, which have been too frequently attended with effects directly the reverse.

In considering the subject of cold and tepid bathing as connected with pulmonary consumption, we propose to introduce some very general remarks on the employment, first of the former, and then of the latter, and conclude by engaging in a general inquiry with respect to the rationale of their operation.

It may be proper to premise, that by the cold bath is understood water at an inferior temperature to eighty degrees of Fahrenheit's thermometer. Between this point and that of ninety degrees, the bath may be termed temperate; and it is only beyond this last degree of heat that the epithet warm can be

with

with propriety applied. From neglecting accurately to observe these distinctions, which are of very material importance, a want of precision has frequently connected itself with directions for the employment of both warm and cold bathing.

Immersion in cold water during the period of infancy has been very generally recommended, and too frequently had recourse to in an indiscriminate manner, to preserve health and insure hardiness. The author has remarked several instances where sensible and sometimes material injury has arisen, from neglecting to observe the precautions necessary to regulate the employment of this important agent in very early years. In infancy, danger to the lungs from cold bathing has been stated to exist in a very inferior degree; and by the practice of dipping infants in cold water, susceptibility to the injurious impression of cold in succeeding years has been thought to be materially diminished. This principle in the abstract is undoubtedly correct, and, with the exceptions and precautions

now

now to be mentioned, may be pursued with propriety and advantage. Two infants may be supposed of one family, with reverse constitutions. In the one a general torpor, debility, and great susceptibility to the impression of cold shall prevail; in the other comparative vigour, activity, and warmth. To pursue without discrimination the same course with respect to immersion in water with each of these children, would obviously be improper. That degree of cold which would refresh and invigorate the one, would confirm debility and augment torpor in the other. A bath which is not cold to the sensations must, in the first instance at least, be resorted to for the weaker infant, and in neither case should immersion in cold water be practised when the external temperature of the body is inferior in degree to its general standard, when after immersion the body appears to be chilled, or when returning heat is attended with febrile languor, instead of the grateful and genial warmth characteristic of the appropriate action of exciting powers. If the

the practice of immersion be guided by a cautious observance of these particulars, it may be pursued with safety, and will be attended with success; but a total neglect of bathing were greatly preferable to the severe and incautious manner in which infants are frequently exposed to these violent and rapid changes in temperature.

After the period of infancy, the infirm and tender are particularly to be guarded against the vulgar errors on the subject of bathing. Young persons who have the phthisical constitution in any remarkable degree require in this respect peculiar restriction; and when in subjects of this temperament catarrhal irritation is present, or induced by causes apparently trivial, the necessity of caution is still more urgent.

It is remarkable with what perseverance certain courses will be pursued, from an idea of their eventual utility, which are even obnoxious to the present feelings. An important and very instructive example is presented by Dr. Beddoes, of irreparable injury to the pulmo-

pulmonary organs, from an imprudent employment and particularly injudicious repetition of cold bathing, which is given on the authority of the late Dr. Pulteney of Blandford—a much respected friend of the author of these pages. "T. C. was *rickety in his infancy*, and very weakly for several years after. In the winter of 1759 he had pleuritic symptoms; a rheumatic fever left him next summer afflicted with chronic rheumatism; he was advised to go into the cold bath: he did so; but, on coming out again, felt such an increased load, fainting, and anxiety about the præcordia, that he thought he should hardly recover the shock it gave him. Nevertheless he ventured in again a day or two after, but experienced the former symptoms in an aggravated degree, and from this time dated the disorder which terminated his life." Many examples might, if necessary, be here cited in illustration of the injurious tendency of cold bathing under various forms and circumstances of debility: sufficient however has been advanced to induce

duce caution with respect to its employment in phthisical temperaments and disorders; and for further information reference is made to those authors who have treated particularly on this very interesting subject, in its general application to health and disease.

Even in cases where frequent immersion in cold water is not objectionable, it may be necessary to caution against bathing when the body is cooled below its ordinary standard of temperature. From the principles already laid down, and which before the conclusion of the present subject will be again referred to, it necessarily follows, that the vulgar fears of plunging into cold water while the body is heated, are fundamentally erroneous. It is an error of modern times, and almost entirely confined to our own country; and it is remarkable that the opinion could at any period have been entertained, that the body requires to be cooled to enable it to encounter a chilling medium.

We now proceed to offer some general remarks on the subject of warm bathing. A

modern

modern author has observed that "a favourable opinion of the utility of warm bathing is daily and very properly gaining ground *." To the weakly and phthisical part of the community will this important melioration in principle and practice most beneficially apply. From what has been stated respecting the deleterious effects of immersion in cold water, under some circumstances of the bodily frame, the advantage attending an opposite practice may easily be conceived. As a preventive measure against phthisical disorganization, the introduction of the practice of warm bathing, in place of the indiscriminate employment of cold immersion, claims therefore a high rank in the scale of modern improvements.

The utility of warm bathing as a preservative from pulmonary consumption may perhaps be principally referred to three sources. It affords a grateful, mild, and uniform stimulus,

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* Dr. Buchan. Essay on Cold and Warm Bathing.

mulus, insures cleanliness of the external surface, and preserves a freedom and regularity in cutaneous perspiration.

When obscure feelings of indisposition present themselves, which, although scarcely amounting to absolute symptoms of even incipient consumption, nevertheless in the phthisical temperament and period of life justly excite alarm, tepid bathing is almost constantly attended with decided and very considerable advantage. In that condition of the system to which we now allude, a disposition to hectic fever may be traced by attentive observation; the pulse is accelerated, and other marks of debility are present. The warm bath arrests the progress of these, scarcely perhaps observable, but alarming symptoms, with extraordinary rapidity; which it effects by virtue of its gentle and generally stimulating power. Sensible benefit has been stated to result from this practice in the great majority of instances; permanent benefit in several; *injury in none.*

The second operation of tepid immersion,

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that of preserving cleanliness of the external surface, may be deemed of general application. Nothing perhaps requires to be impressed with more force, as a preservative of health, than the necessity of frequent ablution; and when this practice shall become more general in Britain, other species of luxury may be enjoyed with greater impunity. "To a correct mind," says an American physician of celebrity, "a dirty cuticle will appear as a dirty shirt* ;" and this inconvenience can alone be obviated by repeated ablutions or immersion.

By maintaining a regularity in the cutaneous discharge, another important benefit is derived from the practice of tepid bathing in the prevention of disease†. It is a circumstance

* Dr. Mitchill.

† It is entirely by virtue of its stimulant power on the general system and vessels of the skin, that the warm bath produces this effect. During immersion cutaneous perspiration is diminished; and in cases where profuse sweats are consequent upon debility and deficient excite-

stance which deserves to be remarked, that in proportion to the freedom of discharge from the various emunctories, particularly of the skin, diminished susceptibility is occasioned to diseased action from those powers which are adverse to health. In a preceding chapter we have endeavoured to prove that the generation and flow of perspirable matter is principally regulated by excitement. It may here be observed, that high and inordinate excitement is most effectually prevented from proving injurious, by constantly supporting the cutaneous vessels in that condition which is favourable to a regular secretion and discharge of sweat; and the most obvious method of insuring such condition is the practice of tepid bathing. "The use of a warm bath of about 96 degrees of heat for half an hour once a day, for three or four months, I have known," says Dr. Darwin, "of great use to weak people, and it is, perhaps, the least

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excitement, frequent bathing in tepid water will abate such inordinate discharge.

noxious

noxious of all unnatural stimuli." And many instances have occurred within the sphere of the author's observation, of the renovating properties of this classical gratification, where, independently of the counteraction of early consumptive symptoms, its moderate employment has appeared to establish an appropriate degree of regular excitement. In the inirritability of old age, whether natural or premature, warm bathing has often proved remarkably beneficial. Of its employment in the infantile period of life we have already treated*; and we shall now close the subject

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* Where scrophula in infants has assumed the form of actual disease, the author has frequently observed the advantages of warm bathing. In these cases, and even at more advanced periods of life, before pulmonary disorder has occurred, sea bathing is often had recourse to with much advantage. If the system be greatly debilitated, warm salt-water baths should at least precede immersion in the open sea, which last is perhaps in every instance preferable to mere cold bathing. The same cautions apply, although not with equal force, to immersion in the sea, with those that have been suggested in relation to the cold bath.

of

of preventive regimen by the introduction of some additional remarks on changes of temperature, and the external and internal application to the living system of both cold and heat.

Notwithstanding the popular prejudices with respect to the sudden application of cold when the body is in a highly heated state, it has been fully demonstrated by the experiments of Dr. George Fordyce and Sir Charles Blagden, that sudden exposure to extreme cold after violent heat is by no means attended with danger to the constitution. This fact is likewise confirmed by the mode in which the practice of bathing is conducted in Russia, and in several other countries, the inhabitants of which, to heighten the luxury and add to the refreshment of immersion in heated baths, or long exposure to vapour of very high temperature, immediately plunge into contiguous cold baths, or rush into the open air, and without the smallest covering to their bodies roll themselves in snow.

Every

Every medical reader is apprised of the important application which has been recently made of these facts in the treatment of febrile diseases; and in the reports of Dr. Currie, to which frequent allusion has already been made in the course of the present work, the prevailing errors with respect to temperature in general are refuted, with the author's accustomed dexterity in reasoning, and extraordinary facility of illustration.

There are, however, certain circumstances connected with the action of cold and heat on the living system, which appear in some measure to oppose the general tenor of Dr. Currie's conclusions.

As an example of the injurious tendency of a precipitate application of cold when the body is heated in a more than ordinary degree, the sufferings of the Macedonian conqueror, from plunging into the river Cydnus, have frequently been adduced. Dr. Currie, however, has endeavoured to prove, that the situation of Alexander previous to bathing was different from that more commonly imagined,

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and that his subsequent illness, as related by his historian, is referrible to circumstances exactly opposite to those to which they are generally attributed—"From the length and difficulty of the march, it is natural to suppose that he must have been *cooled* as well as debilitated by excessive perspiration and fatigue; and under such circumstances, immersion in the cold and rapid Cydnus was followed by the consequences which we should expect from the principles already laid down."

Other circumstances, however, have been arraigned as evidences against the propriety and safety of a sudden application of cold subsequent to violent heat. Many well-attested instances are on record, of instantaneous death, or violent disorders which have terminated fatally, following imprudent exposure to cold while the body has been overheated; and in some of these, the application of the noxious cause has confessedly been made previously to the production of fatigue or coldness. It is by no means uncommon for violent inflammation of the stomach and

lungs

lungs to be occasioned by large draughts of cold water, incautiously taken to abate thirst consequent upon excessive heat; and the injurious effects of the external application of cold water, both to the whole surface and merely to a part of the body, have been circumstantially related, in order to invalidate or qualify the inferences of Dr. Currie.

These apparently contradictory deductions on this very interesting subject may perhaps be in some measure reconciled by the following considerations.

The state of the body, in relation to its susceptibility of being affected by cold media, has more reference to the *kind* than degree of previously existing heat; or, more correctly speaking, although an equal quantity of actual heat may be present in the system, such heat may be abstracted with greater or less facility and safety, according to the mode in which it has been generated. The increase of temperature occasioned by what is termed an inflammatory action pervading the whole system, such as is sometimes observed in violent

lent inflammation of the lungs; that attended with an extremely debilitated state of the vital power, as in instances of what has been improperly termed putrid fever; the heat consequent upon violent exercise; and that produced by communication from without, as in the example of hot baths, or exposures to other sources of great heat while the body continues inactive, are all essentially different in their nature: and although in each case the quantity may be equal, and a thermometer applied to any part of the body's surface shall indicate the same temperature; yet, from such temperature alone, it would be improper to form a judgment on the expediency and safety of the sudden application of cold. In the author's recollection a case occurred of violent inflammation of the whole thoracic viscera, which speedily terminated in death, almost immediately following a large draught of cold-water when the body had been heated from unusual exercise. The deceased was, previously to the event, a strong and healthy man in the prime and vigour of life.

In this case the injury appeared to arise not from the sudden abstraction of heat, but from the precipitate interruption of those *actions* by which the increase of temperature had been generated *. Had the same quantity of water equally cold been suddenly swallowed by a person oppressed and debilitated by febrile heat and irritation, these fatal consequences would not have succeeded, because in this latter case the cold fluid would have operated in deducting from the superfluous

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* Dr. Currie observes, that "postillions understand the difference between giving their horses cold water to drink during exercise, and after the exercise has ceased. When in their power, they always water their horses two or three miles before the end of their journey." In this case sufficient excitement is generated to admit the sudden ingurgitation of a large quantity of cold water without injury. In instances, however, of more vehement action, this practice would perhaps neither be salutary nor free from danger. Suddenly to arrest a *racehorse* in the ardour of his course, and immediately to give him cold water to drink, would, it is imagined, be extremely hazardous. In this latter case the injury would be similar to that related in the text

quantity

quantity of generated and oppressive heat, and the refreshing sensation excited in consequence would have stimulated the languid frame*. The same principle likewise applies in the application of cold media, either partial or general, to the external surface. Dr. Beddoes relates the case of an obstinate eruptive affection being produced on the face, in consequence of "the immersion of that part in cold water when the subject of the affection was heated and thrown into perspiration by play." Had this immersion immediately succeeded to hot bathing, or been made during the existence of dry febrile heat, the injurious effects would not have resulted; for

* The exciting power of cold, which, abstracted from its operation on the sentient principle, is necessarily an universal sedative or negation of stimulus, is illustrated in an extraordinary manner by the beneficial effects which attend its judicious employment in fevers, where, although debility or oppressed power prevails throughout the frame, the application of that degree of cold will preserve, which, in cases of simple debility unattended by heat, would extinguish, the vital power.

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this reason, that the action of the cutaneous vessels would not in the latter cases have been injuriously interrupted, and thus indirectly stimulated into inordinate excitement.

The seeming contrarieties of speculations on the subject of temperature, may perhaps likewise in some measure have arisen from neglecting the very important circumstance of cooling applications "acting through successive moments or by successive quantities." "If a person in a heated state drink half-a-pint of cool liquid, that may not sensibly reduce him below the natural healthy state. But if he pour down a double quantity at once, the last half-pint may be regarded as operating upon the system reduced by the first, and sinking into a dangerous chilliness. So immersion for a moment in a sunny river may strengthen and refresh, as many pedestrian travellers have experienced; whereas delay in the water would be attended with great hazard, on account of the continued operation of a heat-abstracting medium upon a system sufficiently reduced in its tempera-

ture

ture and actions by the first plunge*."—— Whatever might have been the actual condition of Alexander when he plunged into the Cydnus, the injurious effects of his bathing unquestionably originated from the sudden reduction of heat below the standard of health. "Vixque ingressi subito horrore artus *rigere* cœperunt: pallor deinde suffusus est, et totum propemodum corpus vitalis *calor reliquit*." In this case perhaps an exposure to cool air, or immersion in water of a superior temperature, but which would nevertheless have abstracted a certain degree of heat from the languid frame, would have displayed effects exactly contrary to what the historian here relates. In like manner the Russian, who, reeking from his vapour bagnio, immediately rolls in snow, or who, after immersion in a bath which has been heated almost beyond endurance, instantaneously plunges into contiguous cold water, requires

* Dr. Beddoes's Hygeïa.

that the medium to which he is first exposed be extremely great, or the succeeding cold application would debilitate and perhaps destroy. Upon this principle likewise the statement of Dr. Fordyce is explained, that a person passing from a violent degree of heat to much cold, will gradually return to his proper standard of temperature,—while from a sudden change from heat to cold, when the heat has not been so high, diseases will often be generated.

With these suggestions we conclude the subject of preventive regimen, and shall proceed in the ensuing chapter to trace the steps from incipient and scarcely observed disorder to genuine and confirmed consumption.

CHAPTER XII.

History of pulmonary consumption.—Peculiarities of hectic fever.—Treatment of phthisis.—Concluding observations.

REMARKS have already been introduced on the frequently insidious nature, and almost imperceptible approach, of pulmonary consumption. The intervening diseases which have been enumerated in the preceding chapters, are sometimes denoted by characters so extremely obscure that they are often with difficulty traced, and in many instances entirely disregarded—"Multos horum jugulet priusquam se fere ægrotare credunt." The early indispositions of phthisical invalids are likewise in other respects abundantly irregular. A series of symptoms will sometimes be displayed, as indications of the occurrence and establishment of the disorder, while at other times a very slender foundation will be afforded for suspicion, until doubt be exchanged for

for absolute certainty. The history, therefore, of consumption, is to be regarded as a general statement of collective symptoms from a number of different individuals, in almost every one of whom the disorder shall have assumed, in some measure, a diversified physiognomy.

In endeavouring to trace these characters with as much accuracy as the subject will permit, the author will pause at different stages, for the purpose of introducing further remarks on their origin, and likewise on the method of treatment required in the different periods of the disorder.

It is between the ages of sixteen and thirty-five that genuine phthisis, for the most part, appears in a decided and unquestionable manner. If during any period of this interval a short husky cough occur, without perhaps any other observable symptoms of cold: if such cough, although apparently trivial during the day, increase towards the

evening

evening and continue troublesome during the night, harassing the patient and preventing sleep: if this symptom be connected with a sense of weight about the chest, occasioning a degree of oppression in breathing, which is increased by any unusual exertion: if, further, such exertion augment the cough, and produce either a discharge of blood or much pain in any part of the thorax, with an expectoration of frothy mucus: if a general lassitude, with obscure feelings of indisposition, be present; the subject of these symptoms requires vigilant attention.

Danger, however, may exist without their entire concurrence; and, on the other hand, they may be all present without creating much ground for apprehension. The pain in the side is regarded by some authors as that symptom which denotes danger in the greatest degree; and Dr. Cullen's definition of consumption has been said to be defective in not comprehending this necessary character.

Pain is, however, by no means invariably

present.

present. Many cases have occurred in the practice of the writer, where no pain had been observed in any part of the chest during the whole course of the disorder; and the authoritative testimony of an observant and experienced practitioner corresponds with this remark. I have witnessed, says Dr. Heberden, many deaths from genuine pulmonary consumption, where dissection has demonstrated an entire destruction of the lungs' substance, and where, through the whole course of the disease, neither expectoration of blood, difficulty of breathing, nor pain in the side, had been present:—"Neque pectoris dolor, neque ulla difficultas in utrumlibet latus cubandi*." This caution the author has deemed particularly expedient to introduce, for the purpose of preventing any misapprehension respecting the nature of a disorder whose symptoms and progress are thus often fatally insidious.

* Heberden. Commentarii, p. 317.

Where pain has not been complained of, tubercular bodies may perhaps have previously existed; and thus a small degree of irritation may be maintained, which shall gradually, and almost imperceptibly, terminate in suppuration. But in whatever manner this circumstance is to be explained, the fact itself is extremely important.

The most distinctive mark of phthisical irritation in the pulmonary organs, is the appearance, in a more or less exquisite form, of hectic fever. To this symptom, therefore, as a guide to judgment and practice, particular attention is required; and on its nature and peculiar characters we shall here arrest the progress of our history, to make some general observations.

HECTIC FEVER.

Its characters and cause.

The presence of hectic is denoted, in the first place, by a pulse of greater celerity than would be imagined from the appearance of derangement

derangement in other respects. The countenance, although in general pale, is at certain times marked with a crimson colour of circumscribed extent. This flushed appearance in the cheek, for the most part, occurs with some degree of regularity about noon, but may be occasioned at any time of the day by increase of irritation, or by taking any thing into the stomach. When the fever is decided, or the disorder on which it depends exists to a great extent, profuse sweats break out towards the morning, which are principally confined to the superior parts of the body, as on the neck, breast, and about the shoulders*. The tongue is not, as in genuine or pyrexial fever, always furred with viscid mucus, but is often remarkably clean; the thirst is not in proportion to general irri-

* The perspiration appearing more particularly about the breast and upper parts of the body, is a very general, although by no means an universal, characteristic of hectic fever. In the hectic attending pulmonary disorder this peculiarity is most observable.

tation ; there is for the most part a torpor in the functions of the alimentary canal, and the urine assumes a turbid appearance after it has been for some time discharged. Such are the characters of hectic when decidedly marked. A constitutional susceptibility, however, to hectic irritation, exists in some individuals during the whole of life, without any further expression than irregular flushes of heat in the face, palms of the hand, and soles of the feet, when the system may have been suddenly or unusually agitated. It is in the scrophulous, or rather in that constitution which possesses a more than ordinary degree of prædisposition, either to phthisis pulmonalis, or general decline, that this species of irritative action is produced with most facility. Hectic fever has been imagined to arise from acrimony prevailing in the system, or an absorption of purulent matter into the mass of circulating blood. It appears extraordinary that such an opinion could have been entertained even during the prevalence of the humoral pathology, when, as an ingenious

nious writer observes, "putridity and acrimony were the Gog and Magog of medical theorists." This fever is fairly marked in several disorders where no purulent matter is even suspected to exist in any part of the body; and in the infantile complaints of scrophulous subjects hectic fever is a never-failing attendant.

The reader will recollect, that in the introduction to the present work allusion was made to a theory of pulmonary consumption, which attributed the disease, or rather its principal characteristic, hectic fever, to the retention of that quantity of perspiration and phlogiston which is discharged from the lungs when these organs are not impaired by disease. The occurrence, however, of hectic irritation independent of ulcer, is of itself sufficient to invalidate this theory. And although the framer of the hypothesis endeavours to establish an essential difference in pulmonary hectic, and that originating from other sources, his attempt has by no means proved successful; neither is the assertion founded

founded in fact, that in recent affections of the lungs, when their substance is merely inflamed, the fever is continued, and similar to that of inflammations in other parts of the body. In the very commencement of inflammation in the mucous membrane of the lungs, where phthisical disposition is marked and prominent, the general derangement assumes in a greater or inferior degree the hectic character; and this, it is repeated, is the most correct index, even in infancy, of scrophulous disposition, and, in the incipient periods of consumption, of the nature and degree of irritation that may be present. The author has observed instances of hectic fever decisively marked by its most important character—morning sweats—where the irritative actions have been subdued with facility by the measures immediately to be mentioned, where pulmonary transpiration has not been at all interrupted by disorganization of the lungs, and where consequently the increased cutaneous discharge had no dependence upon

" impedi-

"impediment to the exit of the usual discharge by the lungs*."

A want of due balance in excitability between the lymphatic and other parts of animal organization, appears to constitute the essential character of scrophula in its different forms; and to this inequality the phænomena of hectic fever are perhaps with most propriety to be attributed. In those disorders where the lymphatics are principally concerned, as in the mesenteric atrophy of infants, in dropsy, diabetes, and several other affections of the asthenic class, hectic fever is constantly present. Upon this principle of disproportionate action of the absorbent vessels are we enabled to account for that extreme emaciation which invariably attends hectic as its shadow, without an equal derangement apparent in the general health.—" Vires corporis sensim sensimque furatur, donec exanime plane concidat cadaver."

* Essay on Pulmonary Consumption, by Dr. Thomas Reid.

daver." Upon this principle can be most satisfactorily explained the absence of that general shivering which in cases of genuine or idiophatic fever pervades the whole system, but in hectic is never present; and upon this principle likewise the remarkable utility of digitalis in certain stages of consumption, and its apparently contrary effects, appear to be reconciled to the doctrine of stimulation*.

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* In a preceding chapter, that sense of cold, or, as it is more expressively characterized by the Latin term, *horror*, which in a greater or inferior degree constantly precedes the heat of idiophatic fever, was attributed to a sudden suspension of action, or temporary torpor, pervading the whole frame. In this case the sentient principle and animal organization are universally deranged. In hectic fever this is not the case; the irritation in this latter instance is partial and direct. Hence that peculiar languor which is so characteristic of the febrile state, and likewise the sensation of which we have just spoken, both of which arise in consequence of a general affection of the vital power, are not experienced in hectic.

History of symptoms continued.—Treatment.—Observations on chlorotic phthisis.

The symptoms above enumerated may with some propriety be regarded as constituting the first stage of the disorder, of which authors are accustomed to mark three periods: the gradations, however, are so extremely irregular, and often difficult to be traced, that such division is in some measure calculated to mislead. If the irritative actions occur in unfavourable circumstances or constitutions, and have not been early counteracted by appropriate remedies, the difficulty of breathing continues to increase; the cough becomes more violent, and otherwise assumes an altered character; the hectic fever, with night or rather morning sweats, and emaciation, becomes more determinate; the appetite is irregularly impaired; glandular debility appears by hardness and tumefaction of the abdomen; the mind becomes extremely changeable, now depressed by anxiety and now excited by hope: in females and very irritable subjects

subjects a species of hysteric affection sometimes presents itself, and the menstrual discharge is almost constantly interrupted*.

All these affections may occur merely as steps towards the last and almost hopeless stage of pulmonary consumption, when a large discharge of matter unequivocally purulent is observed, with other symptoms afterwards to be enumerated, that denounce a speedy dissolution.

It is alone in the primary stages of the dis-

* It may here be observed that the symptoms of consumption are arrested during pregnancy. This remarkable fact has been referred to the abstraction of that superfluous quantity of oxygen from the lungs, on which the disordered actions have been imagined to depend. It has likewise been attributed to the disposition to nausea which is often induced by uterine gestation. It appears, however, most consistent with the general laws of the animal œconomy, to ascribe this cessation of phthisical symptoms to that powerful excitement which the uterus receives at this critical and important period, by which the irritative pulmonary actions are subdued, and the impetus of vascular action directed into another course.

 order

order that we have a well founded hope of being able to arrest its career. Where there has been no expectoration of purulent matter, however violent may have been the pain, difficulty of breathing, cough, spitting of blood, or even hectic fever, the disease may in general with safety be pronounced curable. Digitalis is a remedy for pulmonary consumption in its earlier periods, which, under due regulations, and with sufficient attention to other circumstances of regimen and diet, may be employed with a prospect of almost invariable relief.

The principal difficulty which the medical practitioner had to encounter in attempting to subdue the primary symptoms of this malady, was the necessity of having recourse to measures that operated with too much force on the general habit. Venæsection, and other parts of what in the schools of medicine is termed the antiphlogistic plan of treatment, appeared to be indicated by the degree of local excitement: a course, however, of this kind could seldom be pursued without exposing the vital energy to the danger of irre-

coverable

coverable exhaustion. The peculiar action of the foxglove, in a great measure, supplies the demand which had been so long urged in vain. When administered in appropriate quantities, it exhausts arterial excitement with so great a rapidity, that its stimulant power is neither perceptible nor injurious.

By many of the most celebrated physicians of the present day, foxglove is indeed termed a sedative. Notwithstanding, however, the high authority which sanctions the employment of this term, the author regards it as extremely objectionable, and fundamentally improper. Excessive velocity of circulation can only be subdued in two ways. The power producing the increased impetus must be directly withdrawn, or a superior force applied. The law of reaction, which regulates the motions of inanimate bodies, has been erroneously extended to animate existence. The course of vital action cannot be arrested by a superior impulse applied in a contrary direction. When, therefore, a sudden diminution of inordinate excitement is obtained;

the effect is invariably consequent, either upon suspension, or the increased agency of exciting power. Thus the medicine of which we are now treating, when administered in a certain dose, will increase the action of the arterial system; in a larger proportion it will produce in appearance, although not in reality, an effect directly the reverse *. In like manner, violent mental excitation has been known to produce an instantaneous extinction of the living principle; an effect which would be improperly attributed to a sedative agency.

The peculiar advantages, however, attendant upon digitalis, arise from the facility with which its dose may be regulated, and its operation secured; and likewise from the important circumstance, that different portions of the animal frame exist in varied degrees of susceptibility to its influence. That such a degree of inequality prevails in relation to

* The stimulant power of small doses of digitalis, even upon the nervous and arterial systems, has been demonstrated by actual experiment.

powers

powers in general, has already been shown; and this circumstance is remarkably displayed by the extraordinary effects of this powerful medicine. Digitalis, while it exhausts arterial action, by operating upon the less irritable system of absorbing vessels, at the same moment gives impulse and energy to these latter: hence its important utility in those asthenic affections, which, on account of their being connected with partial excitation, have been too indiscriminately treated with debilitating agents: hence its power in reducing and regulating the irritative actions of the earlier and even more advanced periods of consumption, before disorganization has been occasioned to any considerable extent; and hence likewise its abundant utility in hectic fever, which has been shown to have such an intimate connection with the state of the absorbents, and the subduction of which is always consequent upon the decline of the original disease *.

But

* The author has been informed, that in the scarlet fever,

But whatever may be the theory by which the practitioner is guided in the administration of the remedy in question, on its extraordinary faculty of diminishing the number of pulsations, without producing irrecoverable debility, opinion must be unanimous. "If any man (says Dr. Ferrier) had expressed an opinion a few years ago, that we should discover a medicine capable of reducing the pulse, without danger, from 120 in a minute to 75 or 80, at the will of the practitioner, he would have been ridiculed as a visionary—yet such is the power of digitalis under proper management."

Foxglove, however, although great, has limited powers; and both reason and experience authorise the conclusion, that, where the substance of the lungs is generally diseased and extensively ulcerated, neither digi-

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fever, which in its type has more resemblance than any other to hectic, the foxglove has proved abundantly useful. Of this, however, his own experience does not authorize him to speak.

talis

talis nor any other agent can effect more than an alleviation of the patient's sufferings. This, indeed, forms the distinctive and melancholy character of pectoral and other affections of organs, which merely, as local diseases, undermine the fabric of vitality, and divide the slender thread by which existence is supported.

Neither can advantage be expected from an indiscriminate or incautious employment of this important agent. To insure success from the administration of foxglove, great attention must be given to regulate the diet and regimen of the patient. The alvine discharges must be maintained with regularity, to obviate the irritation consequent upon a retention of fæces. Every other artificial source of irritation must likewise be scrupulously avoided: ardent spirits, particularly if in an undiluted form, are for the most part highly injurious. Those articles of food and drink should be had recourse to, which supply nutriment without inducing any considerable irritation. A milk diet is generally

and with propriety recommended *. But the caution which, in the earlier stages of consumption, requires to be most strenuously urged, to secure the operation of the medicine and prevent the disorder's establishment, is to avoid an exposure to *sudden and partial variations of temperature*. A moderate and equable warmth is as much as possible to be preserved, and all irritation, either corporeal or mental, carefully to be avoided.

With respect to the form in which digitalis is best administered, the author has been accustomed to employ the tincture, in preference to the powdered leaves, as the dose of the former can be regulated with more facility than that of the latter, and its strength is perhaps preserved with greater uniformity. Ten drops of the tincture may generally be given in the first instance to an adult, which

* A peculiar antiphthisical property has been attributed to asses-milk. The only advantage, however, of this over that of cows, consists in its being in a slight degree more easy of digestion.

may

may be repeated with very gradual increase, two or three times in the course of the day, till the pulse be considerably reduced, or the irritation be in a great measure subdued. It has, however, been remarked with great propriety, that the dose of digitalis, and, it may be added, of all other medicines, is incapable of being regulated by any numerical denomination. The dose may be augmented to a very considerable extent.

Such is the course which, in the incipient stages of phthisis, will for the most part prove of sufficient efficacy to arrest the morbid actions, and prevent organic destruction. The symptoms, however, above enumerated, in some instances occur in connection with, and partly in consequence of, other important derangements in the animal œconomy; and, under these circumstances, sedulous attention must be given to the primary disorder.

It is not the author's intention, in the present chapter, to treat of vicarious, symptomatic, or imaginary phthisis; but there is one exception

ception to the usual course of consumptive ailments, the mention of which it would be improper to omit as part of their general history. The fact has already been stated, and indeed is pretty generally known, that females are more susceptible of consumption than males. This circumstance is to be attributed to their greater delicacy, and more complicated organization, operating, as already observed, by favour of imprudent habits. Female constitutional debility is often displayed in a remarkable degree during the period of puberty, by inactivity, and deficient excitement, in the uterine system. When such torpor is connected with the phthisical temperament, the symptoms of phthisis are frequently to be referred entirely to this source; and were the treatment of the disease merely conducted upon the general curative plan above recommended, without attention to its primary cause, the original debility would, in many instances, be more firmly established; even the affection of the lungs would continue and increase, and the confirmation of

both

both general and local disorder be assisted by the means employed for their counteraction and removal.

It is under these circumstances that the tonic plan is to be pursued, even when arterial excitation may appear in some measure to oppose its adoption. The author has frequently witnessed the dissipation of cough, hectic fever, and even violent hæmoptoe, from the employment of steel and other restringent and corroborating remedies, which some practitioners would have decried as highly improper. Under these circumstances, likewise, emetic substances, whether administered in such doses as to produce their full effect, or merely to excite nausea, are often attended with very important advantage. While they induce a temporary "quiescence of the pulmonary capillaries," their ultimate effect is to give excitement to the uterine vessels, and energy to the universal frame. In cases, therefore, of hæmoptoe, consequent upon deranged menstruation, and attended with other phthisical symptoms, if digitalis

digitalis be employed, its beneficial operation would perhaps be best secured by administering it in such doses as sensibly to impede the functions of the stomach, or even to excite a discharge of its contents. Dr. Darwin refers the operation of this drug entirely to its emetic property; and endeavours to prove that its remarkable power on the absorbent system is associated and indirect. This principle, however, can only apply when administered in large doses. When given in smaller quantities it evidently exerts a directly stimulating agency, as well on the absorbents as on every other irritable part of animal organization.

Before quitting this part of our subject, it may be necessary to add that in the incipient consumption of females, under the circumstances now alluded to, stimulant cathartic medicines, which operate principally upon the inferior portion of the intestinal tube, are sometimes required, such as aloes and other drastic evacuants. It will be recollected, that in a previous chapter, when treating

of pulmonary hæmorrhage in general, without reference to any peculiar condition of the system, it was observed that, in consequence of those irritative actions which in arterial hæmorrhage are generally present, the bowels require to be evacuated by lenient purgatives. To this rule an exception is afforded in that kind of hæmorrhage, which may be regarded as vicarious, occurring in consequence of general torpor, directed in a more particular manner to the uterus and the organs in its vicinity. It is by no means upon the mechanical principle of revulsion, that the beneficial operation of such remedies is displayed; but the principle of their agency consists in stimulating into appropriate action, those languid vessels to which their exciting power is principally directed. It may likewise be observed, that from the prevailing torpor throughout the system, and consequent inactive condition of the alimentary canal, evacuating medicines are frequently required, which operate with vigour, in order to discharge the viscid matter which may have collected

lected on the internal surface of the stomach and bowels, and thus by interposition would otherwise prevent the due action of tonic medicines on the living irritable fibre.

By such treatment, incipient chlorotic consumption will, for the most part, be arrested in its course, which would perhaps continue obstinate, rapidly increase, and at length terminate in pulmonary ulceration, were that plan indiscriminately pursued, which, under other circumstances, would be appropriate and effectual. "Uterus est omnium in mulieribus morborum causa," is an axiom of Hippocrates, which, although not strictly true, is perhaps liable but to very inconsiderable objection. It deserves, however, to be particularly remarked, although uterine derangement be in many instances the more immediate cause of otherwise disordered appearances, that such derangement itself is primarily to be attributed to universal debility, and is principally to be combated by means which exert a stimulating influence, not merely on the organs more apparently and particularly affected,

fected, but which excite and impart vigour to the general frame.

Before returning to the history of consumption, it may be proper to introduce one or two further remarks on other remedies than those to which we have referred, that have been at various times recommended and employed.

The subordinate action of emulsions, to which, both in popular and professional practice, such frequent and indiscriminate recourse is had in cases of cough, has already been represented; and likewise the extreme impropriety and great danger of administering certain balsamic substances of a more irritating nature, when the disorder which they are given to suppress is constituted by an increase of excitement in that very irritable membrane on which their stimulating faculty is chiefly operative. In incipient consumption, however, there can be no objection to the administration of bland emollient substances, provided that they are not employed to the exclusion of more important agents.

agents. The former are so generally known, that they do not require to be enumerated or particularly described.

Other remedies have recently been employed, not merely as auxiliaries, but upon the supposition of their possessing an absolutely specific power of counteracting the symptoms of incipient consumption.

On the Lichen Islandicus or Iceland moss, a plant principally the product of northern and mountainous countries, a pamphlet has lately appeared, and excited some attention. The Iceland moss is described in the work now alluded to, as " pectoral, tonic, agglutinant, antiseptic, sedative, aperitive, corroborant; and at the same time demulcent*." If, however, this plant possess any virtue as an antiphthisical remedy, its agency must necessarily be resolved into a power of affording nutriment and support without producing inordinate irritation.

* Observations on Pulmonary Consumption, &c. by J. B. Regnault, M. D.

Still

Still more recently, a treatise* has appeared in recommendation of uva-ursi,—a plant that had previously been employed, and with apparent success, in certain disorders which, like pulmonary consumption, are almost universally characterized by hectic fever. From such analogy Dr. Bourne was induced to extend the employment of uva-ursi to phthisical affections; and in the work to which we now refer he has detailed several cases, both of genuine consumption and other disorders attended by hectic, in which its administration was accompanied by a greater or less degree of advantage.

From what the author has been able to collect from the respectable testimonies and candid statements of Dr. Bourne, the remedy in question appears calculated rather to apply to those cases of hectic fever which are more decidedly asthenic, and are unaccompanied with symptoms of much local ex-

* Dr. Bourne on Uva-ursi in Pulmonary Consumption, &c.

citement

citement, particularly in the pulmonary organs. When those symptoms which are termed inflammatory were present in the recorded cases, an antiphlogistic course was pursued in conjunction with, and sometimes to the exclusion of, the uva-ursi. The superior advantage of digitalis in maintaining a regular, while it counteracts or suppresses morbid and irritative excitement, has already been enlarged on.

On the practice of warm bathing the author has likewise previously descanted. It may here be proper to observe, that when the tepid bath is employed, during the decided existence of hectic fever in particular, the proper time for immersion is about noon; the temperature of the water must be in a great measure regulated by the sensations and the pulse of the patient. As a general rule, however, it may be stated, that an appropriate warmth will be found in the range from 90 to 96 degrees of Fahrenheit's thermometer. It may be requisite to remark, further, that the propriety of bathing on suc-

cessive or only alternate days must be likewise determined, not by abstract rule, but by actual and individual experience.

Respecting the use of a modified atmosphere, and the inhalation of artificial gas as a remedy for pulmonary consumption, the author defers his remarks till he has completed the history of the disease, to which he now recurs.

History continued.—Palliative treatment.

With much irregularity in respect to time, the progress and establishment of phthisis will be evinced by the following symptoms:—The evening exacerbations of hectic fever, and attendant morning sweats, increase to an alarming extent; the pulse, previously very rapid, is now increased in celerity and diminished in strength; the body becomes greatly emaciated; respiration still more oppressed and difficult; wandering

wandering pains are experienced in different parts of the body, particularly about the breast; the bowels are still more torpid; the tenseness of the abdomen often likewise increases; the feet and ancles become œdematous. At this period the quantity of matter expectorated is frequently diminished; the eyes now assume a dead and pearly whiteness; the temples become still more depressed; the patient complains of a false taste in the mouth; irregularities of thought and expression, and even actual delirium, supervene upon a state of perhaps previous tranquillity and resignation. The symptoms of approaching death continue to increase frequently with great rapidity; aphthous eruptions appear in the fauces; the skin becomes generally of a livid appearance; the nails become black, and their extremities are directed inwards; the costiveness which has hitherto prevailed is at length succeeded by diarrhœa, which is in general the prelude to a speedy dissolution.

As

As, in the history of the primary stage of pulmonary consumption, its principal characteristic, hectic fever, was deferred for separate remark; so, in enumerating the more general signs of the disorder in its later periods, the author has omitted to notice the gradual alteration in the nature of the matter expectorated, for the purpose of considering this subject in a more particular manner.

That a discharge of pus from the lungs is a decided indication of pulmonary ulcer, scarcely needs to be remarked. Neither the actual existence, however, of purulent matter, nor the degree of attendant danger, is in every instance of pneumonic disorder demonstrated by decisive characters. By whatever means abscess may have formed in the lungs, and whatever may be its extent and degree of virulence, its commencement is often obscure. Although, however, the symptoms are for the most part imperfectly indicative of the formation, and even in some instances of the discharge of purulent

matter; yet, when this last occurs to any considerable extent, the condition of the lungs is rendered, for the most part, too evident, by the appearance and rapid succession of the symptoms above enumerated; and, indeed, when the progress has been from slight catarrh or equivocal indisposition to confirmed phthisis, in the manner related in the present chapter, the nature of the matter expectorated is generally ascertained by concomitant circumstances, with greater precision than by the proposed tests of discrimination between pus and mucus.

If, however, there remain any doubt respecting this distinction, recourse may be had to the following experiment, which is taken from Dr. Darwin: Dissolve the matter which is the subject of the experiment in vitriolic acid, or in alkaline water deprived of its carbonic acid: after the solution is made complete, add pure water to it; and if there be a precipitation to the bottom of the vessel, the presence of pus may be considered as demonstrated. "If the material

cannot

cannot be made to dissolve in alkaline lixivium by time and trituration, we have also reason to believe that it is pus*."

Pus, it may be further remarked, both in colour and odour, is for the most part unequivocally distinct from mucus; and although these peculiarities are less observable in what has been termed the genuine consumptive expectoration than where matter originates from other sources, purulent matter is in no case discharged from the lungs, without being attended with some degree of fetid effluvium.

Having thus traced the symptoms of pulmonary consumption in all their varieties, from the commencement to the final period of the disorder, the author now closes the history of the disorder, by a few general observations on the treatment which has been proposed and

* Zoonomia.

adopted when the lungs are unequivocally and extensively ulcerated.

It must be evident, even to the unprofessional reader, that, under these circumstances, a palliation alone of the patient's sufferings can, with any degree of confidence, be expected. The most attentive and judicious conduct on the part of the physician, in cases of confirmed consumption, merely promises to protract, perhaps for a very limited period, that existence which cannot long be supported; and to diminish the urgency of those distressing symptoms which are without radical remedy—" seulement repandre des fleurs sur les bords de notre tombe, et nous masquer l'horreur de ce passage effrayant."

Certain agents, however, have been extolled as remedies for confirmed phthisis, which deserve notice, as having been introduced into practice upon scientific principles. These are the constant inhalation of a modified atmosphere, or artificially prepared gas; digitalis in large doses, and the uva-ursi. Of

Of the last of these the author has already expressed his opinion.

It is a remarkable circumstance, that the two former were employed as antiphthisical remedies, both in the earlier and later periods of the disorder, nearly upon similar principles.

When chemical physiology had demonstrated the important and extensive agency of the oxygenous portion of atmospheric air on the general circulation; when it had been proved by decisive experiment, that the inhalation of oxygen gas invariably increased the excitement of the vascular system; it appeared an obvious inference, that the constant inspiration of an atmosphere with a diminished proportion of oxygen might be had recourse to with success in the earlier stages of pectoral and other complaints characterized by an increase of arterial action. In the incipient periods of phthisis pulmonalis, this condition of the circulation is remarkably prominent. An extensive trial was therefore made of a reduced atmosphere, in different forms, to counteract the primary symptoms of the disorder;

order; but not with success. Such failure appears capable of being explained in the following manner: The increase of arterial action is connected with impeded respiration; and, as we have endeavoured to prove in the preceding pages, originates in debility. Air rendered less pure than what the lungs have been habituated to receive, from the difficulty with which it is inhaled in consequence of the deprivation of stimulus, augments the impediment in respiration, tends to confirm the original weakness, and consequently to increase rather than to abate the irritative actions which constitute the disorder.

The partial success which in some instances attended a protracted exposure to a modified and reduced atmosphere, has been more recently and justly attributed to the *equality of temperature* which such exposure insured—a circumstance which in the course of the preceding pages has been repeatedly represented as absolutely necessary, even to secure the beneficial action of the foxglove.

As in the employment of digitalis, so in

the use of artificial air, success has been anticipated in the confirmed state of consumption, when the lungs are extensively ulcerated, upon a different theory from that which regulated its admission in the incipient stages of the disorder. The difficulty of healing pulmonary ulcer was attributed to the constant exposure of the ulcerated surface to the oxygen of the atmosphere, in the act of respiration. It was therefore conceived, that a subtraction of this principle from inhaled air would, while it diminished the quantity secreted, be a means of inducing a disposition in the ulcer already formed to terminate favourably.—Digitalis likewise, from its great power of promoting absorption from the surface of the diseased parts, and retarding the motion of the heart and arteries, promised, it was imagined, to effect the same most desirable object. In either instance, however, experience has invalidated these plausible theories, and confirmed consumption still triumphs over all the discoveries and real or imaginary improvements in general science, or in the medicinal art.

CHAPTER XIII.

COROLLARY.

Disorders resembling pulmonary consumption in external characters.—Symptoms, causes, method of treatment.—Conclusion.

"Ex rebus *certis*, non adparentibus judicandum."
Elementa Medicinæ, p. 27.

To develop the simplicity and unfold the uniformity of nature's laws amidst the seeming complication and discordance of her multiplied phænomena; to discriminate between real and apparent varieties, and thus "to abridge and facilitate the labour of acquisition*;" is the design of systematic arrangement, and the principal object of the

* "Epargner le temps et ménager l'attention."—Condorcet.

philosopher

philosopher in the construction of general terms.

That nosology has hitherto failed of accomplishing this purpose to that extent which has been effected in other branches of science, is to be attributed in part to the source already alluded to—the impracticability of seizing and embodying the evanescent characters of morbid affection, and in part to those erroneous principles by which, with few exceptions, medical theorists have been guided in the establishment of names and the construction of definitions. Incidental varieties have too often been assumed as indications of essential difference, and mere external signs of disease deemed absolute and satisfactory evidences of the actual interior condition of the animal frame.

When the existence of a certain disorder of the respiratory organs is designed to be indicated by the generic denomination of "pulmonary consumption;" and when this state of the lungs is defined by the following characters, "emaciation and weakness of body, with

with hectic fever, cough, and, for the most part, purulent expectoration*;" the rigid laws of correct nomenclature require that such a combination of symptoms be exclusively applicable to the peculiar affection that they are made to denote. This, however, is by no means the case. Each of the above signs shall present themselves both separately and in conjunction, when the nature and degree of organic disturbance, and likewise of constitutional derangement, differ very materially from those which are purposed to be represented by the employment of the term in question. In like manner, denominations and definitions of diseases in general are deduced from principles of classification fundamentally erroneous, and are for the most part rather calculated to mislead and betray than to direct and inform.

We are left, therefore, to search for other criteria of the essential nature of diseased

* Synopsis Nosologiæ Methodicæ.—Cullen.

affections than those with which we are supplied by nosological systems. To ascertain these is incalculably important. On this account the reader is presented with the following additional remarks on the counterfeit resemblances of genuine pulmonary disorganization: and in tracing the origin, delineating the distinctive characters, and describing the treatment that these require, an opportunity will be afforded of introducing further observations on some of those remedies which have at different periods acquired a temporary celebrity as specifics for phthisis pulmonalis.

We shall endeavour in the first place to demonstrate the manner in which emaciation, debility, and hectic are often produced independently of disorder in the lungs; we shall then proceed to trace the derivation, and mark the peculiarities, of those coughs that are not consumptive, offer some very general sugestions on the different sources of

 pains

pains in the breast, and impeded respiration—which although not included in the above definition are nevertheless too indiscriminately regarded as phthisical symptoms—and then, after attempting to describe the manner in which these expressions of disease, whether exhibited separately or in union, are most effectually subdued, close the subject by a few retrospective remarks.

Emaciation, debility, hectic, independently of disease in the lungs.

There are two species of general emaciation—the one always connected with, the other destitute of *hectic* as a primary and essential symptom. The latter may be denominated atrophic, the former consumptive wasting*. In cases where hectic fever is present, the disorder necessarily assumes the closest resemblance to genuine phthisis, and is, in reality, more nearly allied to this latter affection. To that kind of emaciation,

* *ἀτροφία*, inanition ; *tabes*, consumption.

therefore, which is attended in its commencement by some degree of hectic, our observations are more especially to refer; and in order to illustrate its independent origin, follow the track of its progress, or distinguish it from an expression of pectoral disorder on the one hand, and mere atrophy on the other, it may not be improper to premise a very slight sketch of the anatomy and physiology of that portion of animal organization which is more immediately concerned in its production. Such delineation ought indeed, in strict order, to have preceded those intimations that have already been given of the nature of scrophula, the general character of infantile complaints, and the probable origin of hectic fever.

"A definition of life," it has been said, "might be established on that capacity by which the animal preserves its proper heat under the various degrees of temperature of the medium in which it lives*." It may, how-

* Dr. Currie's Reports, loc. supra cit.

ever,

ever, be questioned whether the definition would not be made more correct and comprehensive, by including the statement of that constant change which every form of living existence necessarily undergoes in the constituent ingredients of its physical construction. The principle of excitability cannot be retained in the organic fibre without a perpetual accession of fresh materials. The blood is the medium through which this process is effected. "Sanguis habet quo corpus alat." This is the vital fluid—the fountain of life and perennial source of health. Its current, however, is both produced and maintained by means of the lymphatic or absorbent vessels. These are small pellucid tubes, which arise by independent orifices or open mouths from the respective surfaces on which they have been discovered, and proceed through various courses to their common termination.

This system of vessels is divided into the lymphatics properly so denominated, and the lacteals. The latter are peculiar to a certain

part

part of the body: they originate from the interior or villous coat of the small intestines: they derive their distinctive denomination from their particular office, which is to receive and transmit the chyle or nutritious portion of the aliment to the blood. In their passage they penetrate a large number of glandular bodies, which thus constitute a material part of their structure. These glands are principally situated on the mesentery—that membranous expansion by which the numerous folds of the intestinal canal are suspended, and retained in connection.

While the lacteals are thus confined to one situation, the lymphatics, as we have above remarked, are common to every part of the body*. These last are conductors, not of chyle,

* The universality of lymphatic absorbents is rather conceived than actually demonstrated. Dissection has not hitherto been able to detect these vessels in the brain: analogy, however, favours the supposition of their existence. If that frequent and too fatal disease of young persons,—water in the brain,—admit of cure,

chyle, but of lymph, or a colourless transparent fluid furnished by those minute terminations of arteries, which, on account of their connection and office, are called the lymphatic or exhalant arteries. The lymphatic absorbents, like the lacteal vessels, are supplied with glands, through which their contents must likewise necessarily pass in their passage to the blood.

The following, then, is the general physiology of the vessels above described. By a peculiar attractive power, the orifices of the lacteals separate the nutritive from the fæculent part of the food, which, acted upon by the mesenteric glands, undergoes a still further

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cure, the remedies by which it is effected must necessarily operate by producing an absorption of the effused fluid. The author imagines that he has witnessed the cure of hydrocephalus by means of the foxglove. The symptoms however of worms, and other infantile affections, often so closely resemble those indicative of water in the ventricles of the brain, that it is scarcely possible to decide, with absolute certainty, on the interesting question of the inevitable fatality or remediable nature of hydrocephalus.

change,

change, for the final purpose of its conversion into, or proper admixture with, the blood. The lymphatics absorb the aqueous deposit from those exhalants with which they are respectively connected; which fluid is likewise conveyed to, and forms a constituent ingredient of, the blood.

The circumstance of principal importance in the rationale of lymphatic deposition and absorption is, that although the *structure* of the vessels by which these functions are performed appears similar through every portion of the body, yet, in consequence of peculiarity in *action*, the matter which the exhalant arteries throw out in different parts, essentially varies both in composition and quality. It is upon this principle that growth is effected, that vital functions are maintained, and the respective characteristics of the several successive stages of existence gradually and regularly developed.

Thus, for example, where osseous substance is required, the earth of bone (phosphate of lime) is secreted. The evolution of soft parts is achieved by the effusion of such ma-

terials as are moulded into vessel or concreted into fibre*. The balance of power, likewise, between this connected and dependent order of lymphatic arteries and absorbing vessels, is variously regulated according to the requisitions of the system, during the progressive periods of evolution, perfection, and decline.

It cannot then be matter of surprise that an interruption of regularity, in the processes of either lymphatic deposition or absorption, should be productive of a rapid declension of strength, general emaciation, hectic fever, and other marks of consumptive ailment—and this independently of actual disorganization or topical disorder of any kind.

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* The above laws of secretion furnish an argument sufficiently decisive against the vulgar doctrine respecting the *mode* in which the effects of restorative agents, whether dietetic or medicinal, are produced. If a certain quantity and kind of *excitement* be generated and maintained in those vessels which deposit the calcareous matter constituting bone, an identity of product is ensured, however diversified may have been the abstract nature or chemical quality of the generative power.

Such, experience instructs us, is frequently the case; and the cause is freed from obscurity.

To account, however, for the superior facility with which tabid or general consumptive affection is induced in some than in other individuals, we must refer to what has already been advanced on variety in constitutional tendency*. General laxity or debility of fibre, it was observed, appears in some instances to be directed in an extraordinary degree to the lymphatic vessels. Individuals characterized by such peculiarity are by consequence subject, in a more than ordinary measure, to an interrupted action of those vessels from which nutrition, growth, and health, have been shown more immediately to proceed.

When emaciation happens during the period of infancy, in constitutions of this de-

* Vide chapter x. p. 164 to 172.

scription,—tabes mesenterica, and an appearance of rickety deformity, are the principal expressions of actual disease*. In youth, the wasting of flesh and strength is often connected with worms in the alimentary or intestinal canal, cough, hydropic enlargement of the ancles, and other marks of lymphatic weakness. In more advanced life, in place of actual emaciation, a tumid, bloated, or, as it is denoted in medical language, cachectic appearance is often assumed; and, together

* When the mesenteric glands are in a torpid state, the inevitable consequence is an impeded excitement throughout the whole vascular system. Hence deformities, and obstructions to growth. The regular and salutary action of those vessels is restrained, which secrete the materials upon which both the strength and proper shape of the bones necessarily depend. In this manner, unnatural curvature is produced in the legs of weakly infants. The head of rickety children is disproportionably large, because the processes of ossification in the cranium, during infancy, are performed with more celerity than in the extremities, and are less influenced by causes which retard the force of the circulation.

with

with cough, a tendency is for the most part observable to a kind of indolent or chronic affection of the liver. In each instance some degree of hectic may be discovered; for of this species of irritation " scrophula is the fruitful parent*."

The causes productive of the above disorders, it may easily be conceived, are all those which tend to debilitate:—in the infantile age, unwholesome food, such as is incapable of affording a proper chyle, with too frequently a substitution, especially among the inferior classes of society, of artificial and

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* Dr. Bourne. Op. sup. cit. p. 178.

The observations of Dr. B. seem to imply the necessity of topical organic injury for the production of hectic. This fever, however, often presents itself without the intervention of local disorder. Dr. Hamilton of Ipswich records a curious instance of its production as a symptom of *nostalgia*, in a Welsh recruit, which, after obstinately resisting every medicinal application, immediately yielded to " the promise of a furlough for six weeks."

destructive

destructive stimuli. Among the children of the poor, likewise, particularly in large cities, uncleanliness and deficient ventilation are copious sources of the diseases in question. In every rank of life, the preparations of pharmacy and the domestic prescriptions of the nursery prove powerful auxiliaries of other directly or indirectly enfeebling agents. On these subjects, however, as likewise on cold bathing as a cause both of general decline and pulmonary consumption, we have previously descanted*.

During the important and susceptible period of youth, the expanding energy of the frame is too frequently repressed, and emaciation, hectic, and other consumptive symptoms, occasioned, by a species of indiscretion in either sex, which is alarming in its nature, and almost incalculably detrimental both in its present and future consequences†. In more advanced years, lymphatic excita-

* Vide chapter xi. p. 209 to 230.

† Hygëia, Essay 4.

bility is prematurely wasted, principally by an intemperate use of vinous or spirituous liquors. Mental affections, however, independently of the agency of mere physical stimuli, frequently produce a temporary reduction of lymphatic excitement, with consequent emaciation and hectic. An habitual employment of empirical compositions, under the impression that such preparations are calculated to correct or discharge imaginary humours, often likewise contributes by almost imperceptible gradations to the production of the effect in question.

Coughs not phthisical.—Purulent expectoration.

Cough, like emaciation, may be divided into two kinds, exclusive of that already treated of as a symptom of pulmonary inflammation. A cough is a forcible and convulsive action of those muscles that are subservient to respiration, and may thus be merely the result of weakness and irritability

in

in the moving fibre fortuitously directed to the respiratory organs; or it may arise more immediately from an exhausted excitability of the pulmonary lymphatics and mucous glands of the chest, and, in this latter case, form part of the series of symptoms indicative of tabid or general consumptive affection. The former of these is generally denominated sympathetic cough. It is an evidence rather of nervous than glandular disorder.

Sympathetic cough acknowledges several sources. A detention of crudities in any part of the alimentary canal, in conjunction with or exclusive of worms; irritation in a distant part of the system, as for example the process of teething in infants; the unseasonable repulsion of cutaneous eruption, erroneously conjectured to cause a translation of morbid matter from the surface of the body to the lungs; have each been productive of cough, oftentimes violent and protracted.

The rationale of its production, in every instance, does not appear sufficiently obvious.

It is, however, no otherwise obscure than that of the phænomena of spasmodic or convulsive action in general. By the introduction of the term sympathy we merely designate an observed effect, and in no measure divine the cause of the symptom in question. When, for example, it is said that the stimulus of indigested sordes is communicated from the stomach to the lungs, by sympathy, or consent of parts, and thus occasions cough, not the smallest accession of information is gained with regard to the theory of its origin*.

That species of cough, however, which is more immediately connected with diminished excitability in the pulmonary lymphatics, may perhaps be more satisfactorily traced to its actual source. In this case, in conse-

* Sympathy is "one of those general and sweeping expressions, which, though nearly banished from other sciences, continue in the writings of physicians, and serve at once as a proof and a cause of the imperfection of our art."—Currie's Reports, p. 190.

quence

quence of the diminished energy of the absorbent vessels, the mucus which the tracheal glands pour out becomes acrimonious and superabundant, affording a direct irritation to the lungs.

When causes which produce glandular cough continue to operate upon subjects disposed to its production, they often ultimately occasion a species of humoral asthma, or a superfluous quantity of lymph in the bronchial vessels, and thus powerfully impede the process of respiration.

Coughs of the description now under remark, are in many instances, as was previously noticed, connected with a diseased condition of the liver: they have on this account, upon those erroneous principles of explanation above hinted at, been referred to "irritative association, or reverse sympathy between the pulmonary and hepatic organs*." Both the one and the other disorder ought to be re-

* Darwin's Zoonomia, vol. ii. p. 479.

garded

garded as equally the effect of one common and general cause.

With respect to purulent expectoration independent of actual disorganization of the lungs, it is to be observed that this can alone take place when these become mere channels for the exit of pus generated elsewhere. On account of the contiguity of the lungs to the hepatic viscus, violent inflammation of the latter organ has been known to terminate by a discharge of matter from the former, and the patient has recovered "without injury to the lungs*." Pus, however,

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* Dr. Clossy relates a case of abscess in the liver, where the matter was coughed up to the quantity of a pint in a day, and the same passed by the bowels, thick and fœtid. There was no hectic fever, and the patient recovered without injury to the lungs. It continued from the end of January till April.

In cases of equivocal affections of the lungs, the utmost attention should always be given to the presence or absence of those symptoms which denote hepatic disorder.

may at length be generated by repeated irritation of the pulmonary vessels from mere sympathetic or glandular cough. This is not an unfrequent occurrence in advanced life, particularly in subjects who have habituated themselves to an intemperate indulgence in fermented liquors. It is in this manner alone that asthma can with propriety be said to terminate in genuine phthisis.

Pains in the side and breast, with disordered respiration from simple debility.

There is scarcely an axiom in medicine of greater practical application and utility, than, that pain is by no means an absolute evidence either of inflammation or even augmented action. That mere muscular debility may prove a source of urgent pain in the breast, has already been observed*. It is however extremely important further to

* Vide chapter xi. p. 208

recollect,

recollect, that disorder even in the internal and visceral organization may be the cause of such symptoms, exclusively of affection of the lungs. Dyspeptic are too often mistaken for consumptive pains. It is a remarkable circumstance, and deserves particular notice, that those individuals who are constitutionally subject to the former, are in an inferior degree liable to that irritation of the mucous membrane of the lungs from which the latter originates. This law, however, is not without exceptions.

Those painful sensations which are principally referred to the breast, but which nevertheless do not depend either upon inflammation in the interior or spasmodic action of the exterior pectoral organs, arise, for the most part, from affections of the stomach. An infacility of action in the muscular fibres of this organ, and consequent fatigue from exertion, are in themselves a direct source of dyspeptic uneasiness and pain: from such impeded energy, however, the process of

digestion is interrupted, and crudities are collected in the stomach, which both by quantity and quality are productive of diseased sensations: for, when the requisite degree of living power is not exercised upon the received aliment, or when the functions of the stomach are not regulated by due excitement, its contents become subject to the influence of chemical laws; fermentation commences, and acidities are produced, that, irritating its nerves, generate those harassing and oftentimes lancinating feelings with which the dyspeptic invalid is so familiar, and which an hypochondriacal imagination and erroneous judgment often attribute to phthisical disorder in the lungs. Distension from gas, extricated in the fermenting process, is likewise a further source of stomach pains.

Under these circumstances it cannot be surprising that the respiratory functions should likewise be impeded, or rendered irregular; for to general depression of vital

power

power is added the influence of local causes, which obstruct the freedom of pulmonary action. A distended or inflated stomach materially diminishes the capacity and play of the lungs.

When difficult breathing is a symptom of glandular weakness and derangement, an enlarged liver, obtruding upon the dimensions of the lungs, often contributes forcibly to its production. Enlargements likewise of other abdominal glands, both lymphatic and secretory*, by interfering with the orderly motions of the diaphragm conduce to the same effect.

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* By secretory glands, we mean those that are distinct from the lymphatic system, and which secrete their own peculiar fluids: such is the pancreas, which is placed in the superior portion of the abdominal cavity. The liver, the kidneys, and others are of this nature. It is to be observed, that those individuals whose constitutional stamina dispose them to lymphatic, are likewise most obnoxious to disorders of this last order of glands, arising from general causes.

Method of discriminating between genuine and spurious phthisis.

When emaciation, cough, hectic fever, and pains in the side, are present, either separately or in combination, and still the essential nature both of constitutional and local affection is equivocal or obscure, the practitioner is to be guided in his decision by the age, previous habits, and general temperament of the patient, the symptoms antecedent of the disorder, the character which the cough assumes, and its concurrent peculiarities; and lastly by the symptoms attendant on pain in the side or chest, with the circumstances by which such pain is either aggravated or relieved.

If the disordered states be engendered either in very early or in advanced life; if evident causes of a directly or indirectly debilitating nature have operated to their production; if the emaciation have appeared to precede

precede rather than follow the pulmonary ailments; if these last have not been ushered in by catarrh, pneumonia, or hæmoptysis, in any degree; there can scarcely remain a doubt that the wasting of flesh and strength has no relation to a disordered condition of the lungs.

This will be rendered still more obvious and decided by an attention to the characteristics of the prevailing cough. We have before stated, that tubercular cough in particular is denoted by that semi-hecking kind of character indicative of phthisical irritation, and that, when a cough of this description is connected with the hectic flush in the cheek, approaching danger is plainly indicated. In cases of sympathetic or glandular affection, the fits of coughing are in general more violent, convulsive, and have longer intermissions: "vehementiores sunt, et magis sonoræ, quam quæ fiunt ex tabe, sive incipiente seu deplorata*."

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* Commentarii Heberden. p. 373.

If worms be the immediate occasion of this secondary cough, beside the more ordinary signs of ventricular, intestinal, and glandular derangement, a tumid appearance of the face, more especially of the upper lip, is generally observable; the breath is remarkably offensive; the internal membrane of the nostrils is affected with a peculiar irritation; and in infants starting in the sleep is a frequent symptom*.

When

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* The presence of worms does not always imply an affection of the lymphatic system. When these animalcula are generated independently of glandular disorder, the attendant fever often assumes an intermittent rather than a hectic character. Epileptic fits are not seldom excited by worms.

It is extremely important to recollect the symptoms by which their existence is denoted.

It will not however be improper to observe, that although both the general and pulmonary affections, originating merely from this source, in many instances appear nearly similar to genuine phthisis, the combination of worms in the stomach and intestines, with actual ulceration of the lungs, arising from direct irritation, is by no means unfrequent: of this combination

When hepatic disorder, of the nature previously described, attends the cough, and other apparently consumptive affections, some degree of pain is for the most part experienced in the right side about the region of the liver, which shall extend to the shoulder of the same side; a disposition to anasarcous swellings in such instances is by no means uncommon, the countenance assumes a sallow hue, and the general appearance is indicative of much languor and inaction.

If, notwithstanding these discriminative marks of the nature of thoracic pain, already described, the immediate cause of this symptom still remain indeterminate, the effects resulting from a full and forcible in-

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tion the author recently met with an example, in which a large tænia or tape worm was discharged from the stomach, in the act of vomiting, not many days previous to the fatal termination of phthisis pulmonalis; which last disorder was evidently consequent upon reiterated and neglected attacks of hæmoptysis.

spiration

spiration will materially assist in deciding on its character. When any portion of either the membranes or substance of the lungs is inflamed, the introduction into the bronchial cells of a larger volume than ordinary of air never fails sensibly to irritate. This is not the case when the pain in the side or chest is not inflammatory, but dyspeptic. What exasperates the one mitigates the other. A cold, dense and oxygenous atmosphere, which animates and refreshes the dyspeptic and hypochondriacal, proves, upon the principles previously explained, a source of further injury when the lungs are already in a state of inflammation.

The above test of discrimination is not perhaps equally certain, in ascertaining whether the affection of the breast proceed from a spasmodic condition of either the pectoral or intercostal muscles; for in this last case the pain will likewise be aggravated by an unusual exertion of the pulmonary organs. When, however, pain follows such exertion in consquence of mere muscular debility, it

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is especially urgent during the act of *throwing out* the air from the lungs; while, in the instance of inflammatory irritation, the increase of pain is, on the contrary, principally perceptible at the moment of *inspiration*. The reason of this is sufficiently obvious. The external application of any stimulus to the breast, such as vitriolic ether, may likewise assist in determining the actual nature of the prevailing affection. Such application generally calms the pain of spasm, and oftentimes aggravates that of inflammation.

Affections of the stomach may likewise be frequently distinguished, from those of the lungs, by the presence or absence of acid irritations, or flatulent discharges; by the pain being in a less or greater degree defined and stationary; from its undergoing a temporary diminution or increase by those stimuli which act more immediately upon the muscular fibre of the stomach; and finally, by the mental feelings of the invalid: for it is a fact, that nearly the whole substance of the lungs, in cases of phthisical irritation, is

oftentimes

oftentimes destroyed in an almost imperceptible manner, while the unconscious victim shall hardly be persuaded of the existence of serious malady ; and, on the contrary, as before observed, the dyspeptic, without the smallest grounds even of suspicion, will be readily induced to conceive himself actually consumptive.

General plan of treatment.

We have repeatedly asserted in the course of the preceding pages, that confirmed consumption scarcely admits of radical cure. The numerous examples that seem to invalidate this opinion, are perhaps to be referred to mistaken apprehensions respecting the essential nature of those disorders that have been successfully combated by imaginary antiphthisical remedies. It is only upon this principle that the remarkable contrariety of reports on this very interesting subject can be in any measure reconciled and explained.

It

It may readily be inferred from what has been intimated in the present chapter, that an accurate investigation is generally required, and even sometimes is insufficient, in order to enable the medical practitioner to draw the line of distinction between genuine pulmonary disorders, and such affections as are widely different both in their origin and character.

When, from deficient success attending the common routine of practice, a novel plan of treatment is adopted, with evident and radical advantage, in cases of imaginary consumption of the lungs, the remedies thus had recourse to obtain a temporary but surreptitious fame, for the possession of antiphthisical virtues, of which, however, they are deprived by time and more ample experience.

In a treatise on phthisis pulmonalis, to which frequent allusion has been made in the

the present work*, the employment of *emetics* is recommended, with an assurance of almost invariable success. That such practice has proved abundantly beneficial in many cases of cough, attended with emaciation and hectic fever, cannot be questioned. Several examples are on record, and might if necessary be quoted, of immediate cures of supposed pulmonary consumption effected alone by the agency of emetic substances.—But such cases have not been truly phthisical.

Emetics are highly serviceable both in glandular and mere dyspeptic cough: in the former instance they stimulate the languid absorbents, and impart energy to the system in general. Such extraordinary power, indeed, does the act of vomiting exert on the lymphatic order of vessels, that large tumours have often, in this manner, been abruptly and unexpectedly dispersed. Emetics likewise

* Essay on Phthisis Pulmonalis, by Dr. Thomas Reid.

exercise an extensive influence over the biliary organs, and the lacteal glands of the mesentery. Hence their abundant utility in the tabes mesenterica of infants, and in those affections of the adult that are connected with a torpid condition of the hepatic viscera: with both these disorders, cough, as already remarked, is a frequent concomitant.

When cough is the offspring of crudities in the stomach, independently of disorder in the lymphatic or secretory organs, it is likewise counteracted and subdued by a seasonable administration of emetics: in this latter case, the immediate cause of irritation is removed, and the effect almost instantaneously ceases*.

As operating in some measure upon similar

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* The choice of emetic substances is of inferior importance to what has generally been imagined. In cases, however, of lymphatic affection, particularly where the object of the practitioner is to excite the action of the biliary organs, ipecacuan, or a combination

milar principles with emetics,—cathartics, composed of calomel and some one of the drastic purgative roots, demand to be enumerated among the remedies for general consumptive ailment, and secondary affections of the pulmonary organs. In disorders engendered by lymphatic weakness, the utility of these medicines is remarkably conspicuous. Like emetic substances, calomel excites in an especial manner the biliary secretion, and thus often arrests the course of those deranged actions that are connected with, or in some measure dependent upon, an inactive state of the liver. In quantities apportioned to the age and circumstances of the invalid, this active and important medicine, administered with such combinations as to ensure intestinal evacuation, ought in general to precede, or alternate with, other stimulating agents, for the eradication of glan-

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tion of this with antimony, is perhaps preferable to an emetic formed alone of the latter, which on the other hand appears more suitable in mere nervous or febrile disorders.

dular complaints. In that species of sympathetic consumption described in the preceding chapter*, calomel in the dose of three or four grains ought in general to be conjoined with aloetic purgatives. That mercurial preparations in general, without reference to their cathartic agency, exert a considerable influence over glandular organization, is fully exemplified by every consequence resulting from their exhibition. It is principally by virtue of this active medicine, that alteratives and deobstruents, as they have been erroneously entitled, display their power. Like all other stimuli, however, while they excite, they necessarily tend to the destruction of the irritable principle; and urgent circumstances alone require and admit of their protracted administration.

Should the cough remain after a due trial of the above remedies, which it fre-

* Page 252—257.

quently

quently does from habit, although the original source may have been removed, expectorants may be had recourse to; of which the most efficacious are squills and gum ammoniac, in combination with opium. It is the indiscriminate or mistaken use of these powerful stimuli, both in professional and empirical practice, which often precipitates the event of confirmed consumption, from incipient inflammation of the mucous membrane of the lungs.—Cough medicines are too often extensively and irrecoverably detrimental.

In the employment of those remedies which from an erroneous theory of their operation are denominated Tonics, it will be found of material consequence carefully to discriminate between the different features above delineated of debility and emaciation. Where the lymphatics are principally concerned, chalybeate medicines are in a high degree serviceable. On the contrary, in cases of mere nervous atrophy, they often rather tend to

irritate and weaken, than to stimulate and restore.

Of this medicine (steel) in instances of tabid disorders accompanied with hectic fever, it is scarcely possible to speak in terms of too high encomium. It affords a permanent excitement to the previously languid fibre, and in an astonishing manner recruits the sinking energy of the absorbents. With respect to the principles upon which its agency is displayed, nothing further is ascertained than that it acts as a permanent or durable stimulus.

When modern chemistry began to be extensively applied to the explanation of physiological and pathological facts, the virtues of steel were inferred from the remarkable facility with which it enters into combination with oxygen. Thus, chalybeate like some other pharmaceutical preparations were generally conceived either directly to oxygenate the system, or, by combining with the circulating fluids, and insinuating themselves among the fibres of the body, become a

mean

mean of enabling the languid frame to attract more oxygen from the atmosphere. This theory is correct only inasmuch as steel, by permanently augmenting the force and activity of the vital power, restores the lost energy of the exhalant arteries and absorbent vessels, facilitates the respiratory functions, gives vigour to the circulation, and oxygen to the blood*.

In mere atrophy, we have just remarked,

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* The preparation of steel in principal use by the practitioners of this country is that introduced by Dr. Moses Griffith. This is a combination of ferrum vitriolatum, or sulphate of iron, with powder of myrrh and vegetable alkali. The addition of this last ingredient interferes with the chemical composition of the chalybeate, and appears to diminish its medicinal power. The author is accustomed to employ the steel without the saline admixture.

For the forms and doses of medicine, the reader is referred to the Treatises on Materia Medica aad Pharmacy. Of these the most recent and instructive are Dr. Duncan's edition of the Edinburgh Dispensatory, and Murray's Elements of Materia Medica and Pharmacy, in two volumes octavo.

chalybeates are less decidedly proper. Vegetable tonics, or those metallic oxides which act more exclusively upon the muscular fibre, are to be preferred under these circumstances.

Of the former, Peruvian bark, and the roots of columbo, gentian, and the quassia wood, are chiefly in use: of the latter, arsenic and zinc appear the most efficacious. The important agency which these metallic preparations, and arsenic in particular, exert on the living fibre, has not perhaps hitherto been duly appreciated. It is generally known in those counties of England where intermittent fevers prevail, that these disorders often yield with much greater facility to arsenic than to the cinchona bark.

In the treatment of disorders depending upon nervous debility, it is for the most part proper, without creating copious perspiration, to maintain the cutaneous vessels in that condition of excitement which favours a gentle diaphoresis: the other stimuli that are employed will thus be less disposed to irri-

tate, and to encourage the pyrexial tendency which often prevails in affections of this nature. Small doses of antimonials may be used for this purpose.

Bodily exertions apportioned to the strength of the invalid ought always to be enjoined or encouraged. Those exercises which greatly agitate the system, such as riding on horseback, are more especially useful in cases of lymphatic than in mere nervous weakness. Horse exercise was deemed by the celebrated Sydenham as a specific even for pulmonary consumption*. Riding in a carriage has been found efficacious in preventing the accessions, or mitigating the violence, of hectic paroxysms. Sea voyages operate, perhaps, nearly upon similar principles.

A constant and forcible impression of that

* "Neque mercurius in lue venerea, neque cortex Peruvianus in intermittentibus, efficaciores extant, quam in phthisi curanda exercitium jam laudatum."

Sydenham. Epist. ad Cole. 1705.

remarkable and almost unlimited power, which the mental faculties possess over the energies of the body, ought in every instance to regulate medical practice.

Philosophical and effective medicine involves more than a mere acquaintance with the rules of medicinal prescription.

The restorative virtues of certain places and climates are principally operative as they are imaginary. Independently of superiority of temperature, atmospherical salubrity, and other extrinsic advantages, which it ensures, change of situation must be equally inefficacious, in the treatment of consumption, with the alterative ptisans of the French practitioners, or specific antiphthisical drugs. The preventive or curative properties of natural and artificial waters, exclusively of their sensible effects on the system, are likewise ideal. It is however necessary to observe, that while tepid immersion and sea bathing, under the restrictions previously enjoined, and upon the principles before laid down, prove so extremely salutary, the former in the pulmonary, the latter

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in the hectic of general consumption,—in either instance, both the external and internal use of the waters of *Bath*, instead of diminishing, confirm the symptoms and ensure the permanence of the disorder. To the paralytic or nervous, they appear congenial; to the tabid or hectical, they are highly deleterious. "Quapropter hujusmodi ægroti iterum iterumque monendi sunt, Bathoniam fugere longè, nisi se velint, in summo semper periculo versatos, reddi deploratos, et prope depositos."

CON-

CONCLUSION.

THE facility of obviating a constitutional tendency to, or repressing the primary symptoms of phthisis pulmonalis, is proportioned to its difficulty of cure when the characters of the disorder are fully confirmed, and the texture of the lungs almost wholly destroyed.

Preventive measures should commence with infancy. The physical temperament, like the moral character, retains through life the stamp of early impression.

A regular supply of nutritive aliment, such a mode of dress as is not calculated in any measure to interrupt growth, or impede functions, with unrestrained exercise, and the free enjoyments of an unsophisticated and salubrious atmosphere, are the most effec-

tual barriers against the invasion of this disease.

That idea, however, which is by far too prevalent, of confirming health and ensuring hardiness by casual and transient exposure to natural or artificial severities, while an effeminate or debilitating mode of living is indulged, appears fundamentally erroneous.—The tender and fragile plant of the hot-house would be destroyed, or irrecoverably injured, by that degree of cold which is congenial and salutary to the growth of natural or unassisted vegetation.

The *living* fibre is not braced and strengthened upon the principles of mechanical corrugation or chemical attraction. An indiscriminate employment of cold immersion too often establishes those symptoms of weakness which it is intended to remove, and accelerates the disorders that it is imagined to prevent. That degree of cold which is unpleasant to the sensations, whether applied generally, or only to a part of the surface of the body, ought in an especial manner by

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the phthisical to be fearfully avoided.—When pulmonary disease is actually present, this caution is still more requisite.

Transitions from an extremely high to a very low temperature may, for the most part, be made with impunity.—It is the reverse transition from which danger is chiefly to be apprehended. What is denominated catching a cold, ought rather to be called catching a heat. The sudden application, however, of exterior heat, after its temporary subduction, is not absolutely necessary in order to produce the symptoms of catarrh.

Plunging into cold water immediately after exercise is attended with danger in proportion to previous fatigue or exhaustion. It is in some measure upon similar principles that catarrhs and consumptions are induced by suddenly passing from the crowded apartment of a midnight assembly to a frigid and damp atmosphere.

Coughs are by no means absolute indications of catarrhal affection. The idea of

"specific remedies for coughs and colds," is founded upon a total ignorance of the laws and functions of the animal œconomy. It is equally inconsistent with and contrary to both philosophical principles and actual experience, as the vulgar and empirical notion of correcting impurities in the blood.

Urgent pain is often unaccompanied by inflammation or increase of local excitement. It is in many instances consequent upon the difficulty and labour with which an enfeebled organ performs its accustomed and salutary action.—An importunate demand for invigorating resources, is too commonly supplied by enervating powers.

The flushed cheek and emaciated appearance, are the most faithful attendants upon genuine phthisis. Even these, however, are not absolute indications either of the presence or absence of pulmonary consumption.

A familiarity with the physiognomy of this disease can only be acquired by an assiduous attention to its ever-varying shades,

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and by carefully marking its multifarious expressions. In proportion, however, to the difficulty of the task is the necessity of its accomplishment. Delays and errors are here especially to be dreaded. Decision comes too late, when not merely the nature of the disorder, but likewise its fatal termination, almost ceases to be a subject of doubt or inquiry. To know the rocks on which his vessel has foundered, affords but small consolation to the shipwrecked mariner.

THE END.

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